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INDEX NUMBER

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FOUNDED IN 1896
BY
MAX A. GOLDSTEIN, M.D.

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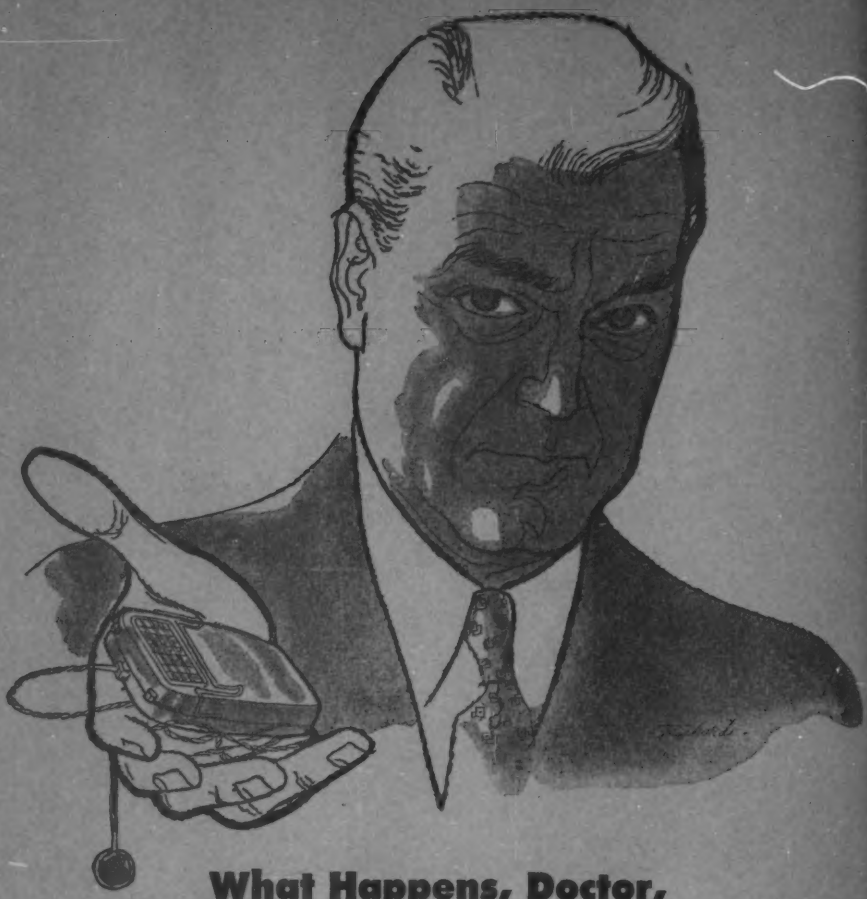

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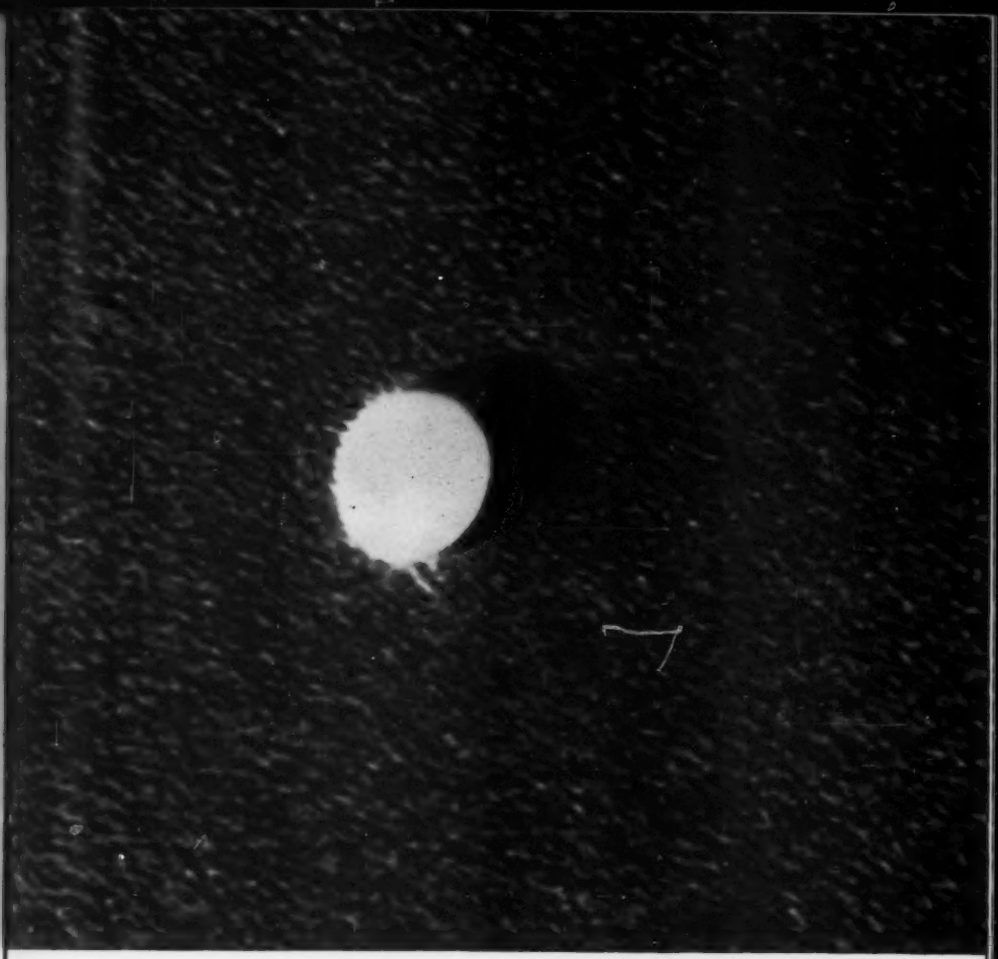

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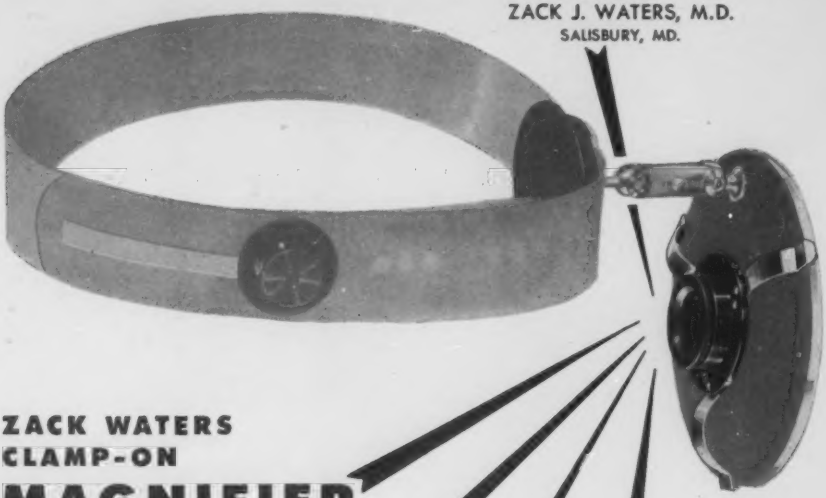

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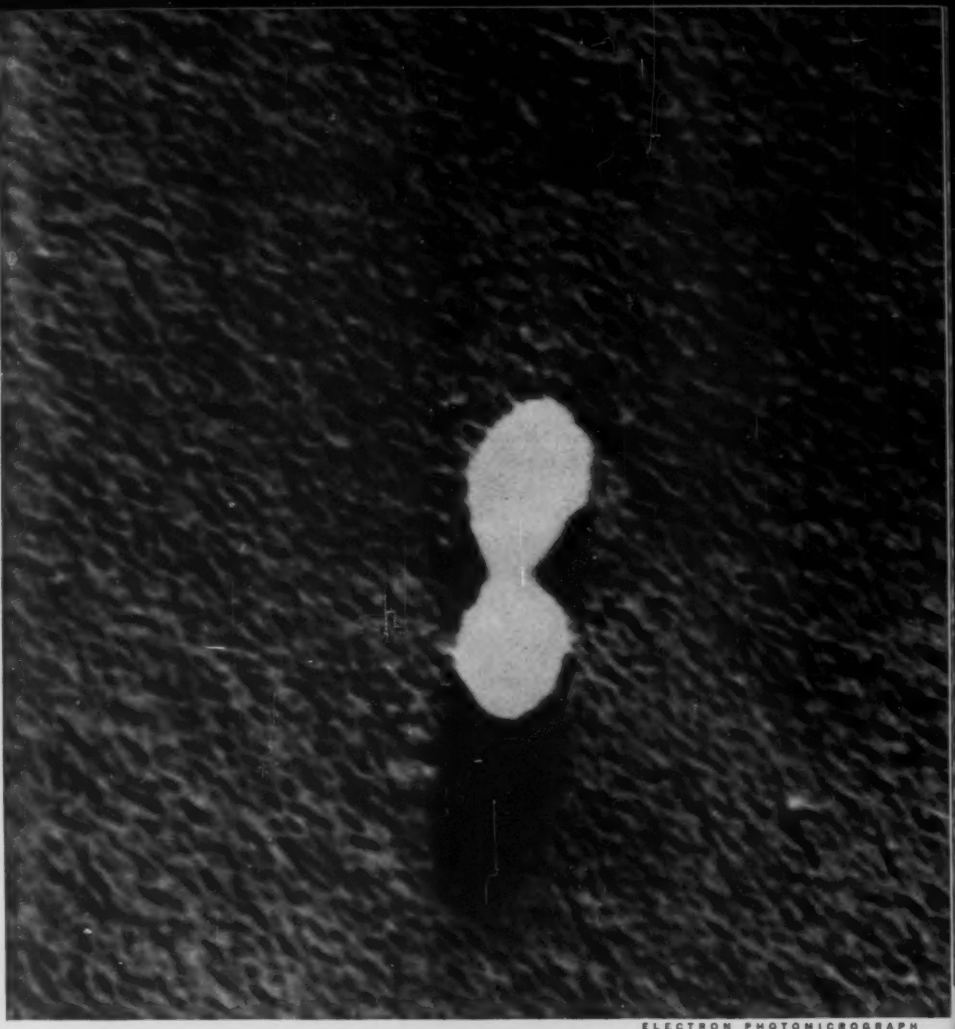

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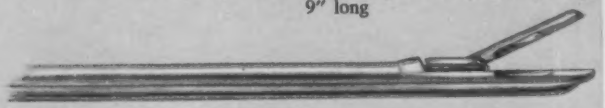

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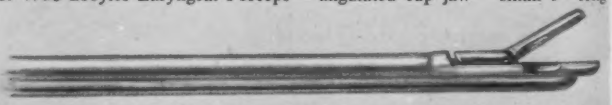

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References: 1. Gutner, L. B., Gould, W. J., and Cracovaner, A. J.: The Effects of Cyclizine (Marezine) Hydrochloride and Chlorcyclizine (Perazil) Hydrochloride upon Vestibular Function. A. M. A. Arch. Otolaryng. To be published. 2. Witzeman, L. A.: Marezine in the Treatment of Vertigo. To be published.

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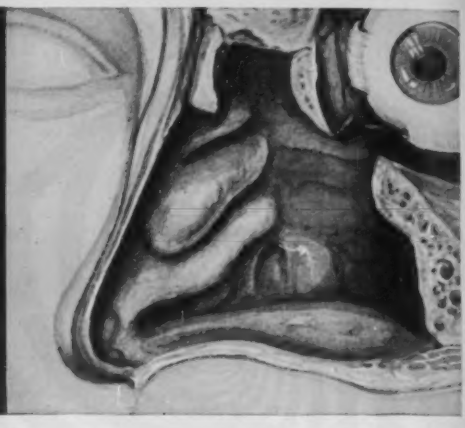

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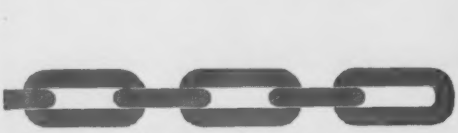
*Sherber, D. A.: The Control of Bleeding, Am. J. Surg. *86*:331 (Sept.) 1953.



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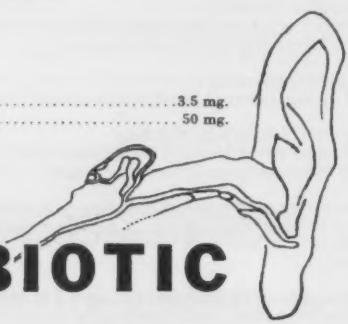

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ELECTRON PHOTOMICROGRAPH

Klebsiella pneumoniae 35,000 X

Klebsiella pneumoniae (Friedländer's bacillus) is a Gram-negative capsulated organism commonly involved in various pathologic conditions of the nose and accessory sinuses, in addition to bronchopneumonia and bronchiectasis.

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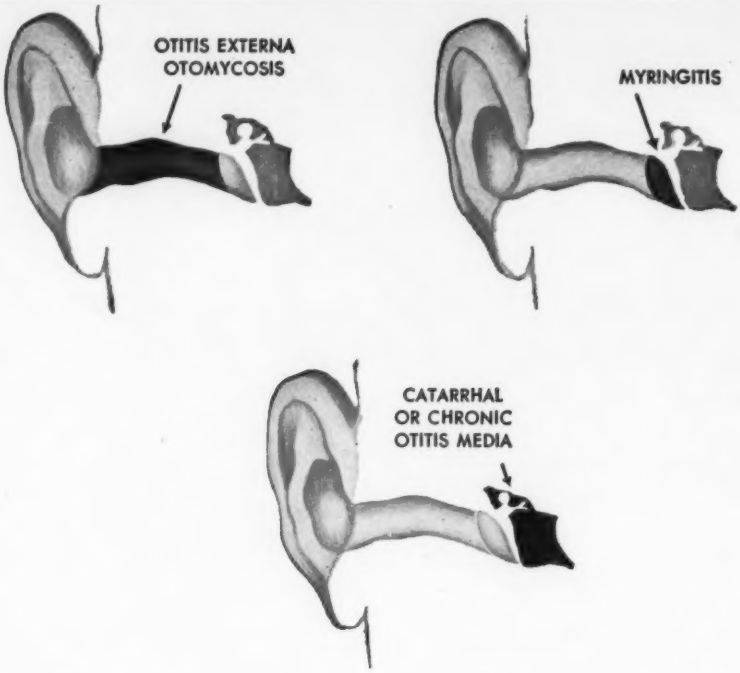

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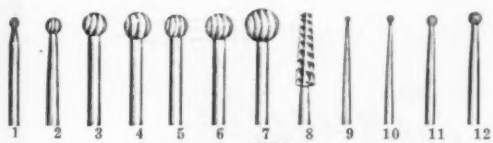

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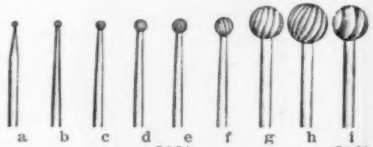

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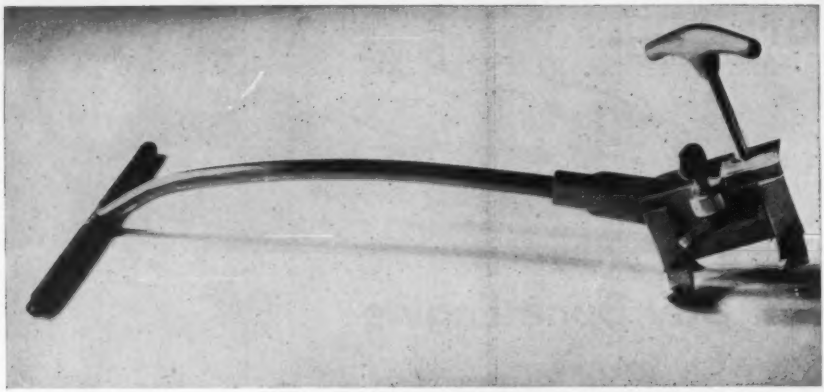

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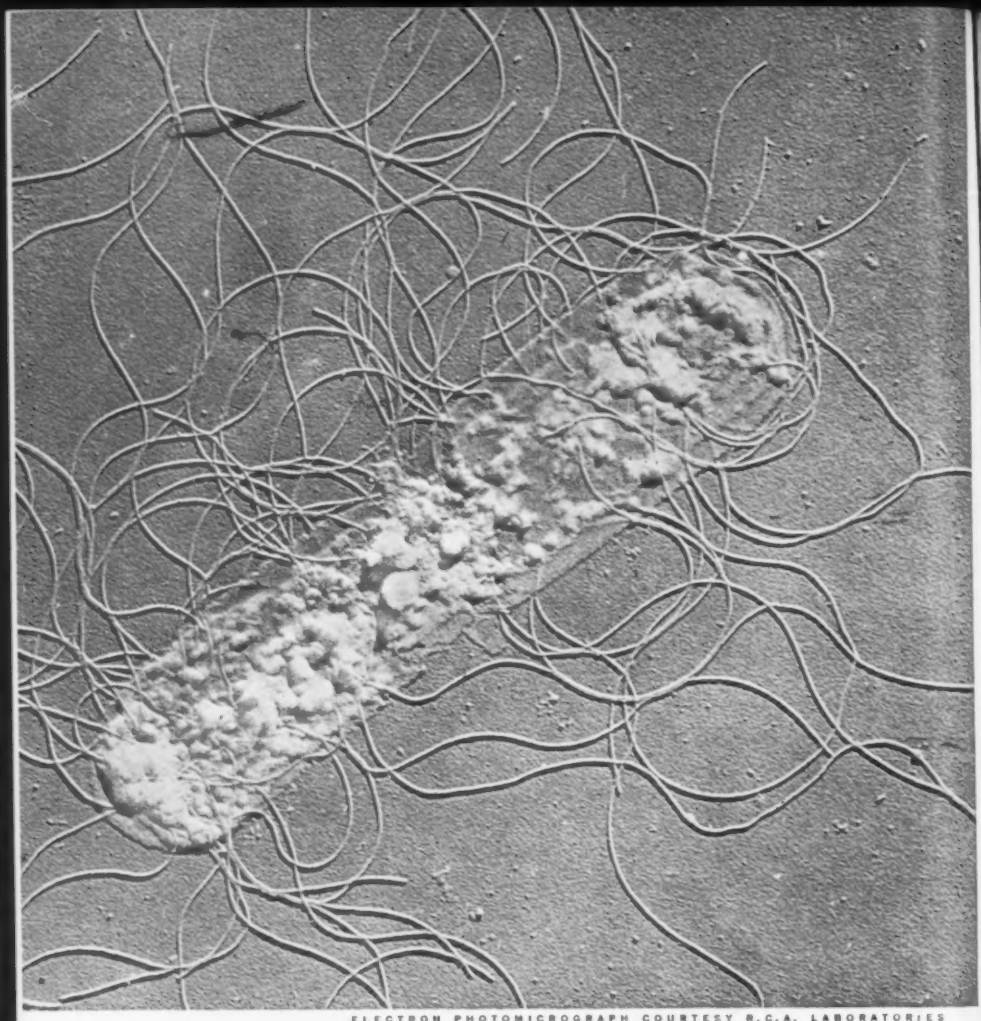

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VOL. LXIV DECEMBER, 1954. No. 12

NUTRITION AND RELATED PROBLEMS.*

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and
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In this thirteenth editorial concerning Nutrition, we present our gleanings from the literature on the five kindred subjects, Nutrition, Endocrines, Autonomic Influence, Stress and Allergy. Although well aware that we are not familiar enough with them, we have come to realize their immediate importance in our daily practice, particularly since otolaryngology has come closer to the field of general medicine.

Nobody can study an article on any one of these five problems without being struck by its close relation to one or more of the others. We have felt the apparent fitness of listing the several contributions under these five headings, yet we particularly emphasize the close relationship which forbids their separation but rather points to their kinship. In clinical practice they are closely interwoven; in a study of a patient, the understanding of one factor is certainly not clear without an understanding of the others. Into each one's practice come a hint of this interrelation and also the desire to master it. We find this concept helpful, not only with the patient whose symptoms have no obvious cause, but particularly with those whose history and findings offer no clue whatever. In taking a history we can at least mention the five subjects to the patient to see if one or more of them may lead to something suggestive. In a discussion of these points the patient often reveals pertinent facts.

* To be presented at the Midwinter Convention of the Research Study Club, Los Angeles, Calif., January, 1955.

Studies on these five problems are the object of our constant search. The special aim is to find those that suggest an approach to treatment. Rapid strides are being made in each subject, and the hope is that our offerings will provide a glimpse into recent findings, from sources to which our readers ordinarily would not have ready access. We have wandered from the medical library to the bookstore, where authors present medical topics in language understandable to lay readers. Little is to be found in ear, nose and throat literature. It was Socrates himself who advised us — "Employ your time improving yourself by other men's documents. So shall you come easily by what others have labored hard for."

* * *

1. NUTRITION.

Despite the intensive labor that has been expended on the part played by salt in the body economy, we still have much to learn about the real need for it by our tissues. Meneely[1] takes us back to the days when our forebears were cave-dwellers or nomads and lived by hunting and fishing; later came the more settled pattern of life in settlements, with the beginning of agricultural industry and an adjustment of food habits to new conditions. A cereal-vegetable diet in large part replaced the exclusively meat diet. Here came the change in sodium intake; whereas the earlier meat diet contained four or five times as much potassium as sodium, the cereal-vegetable diet had 12 to 20 times as much. This may be an explanation for the use of salt as an added item of diet. By way of corroboration, it is well known that the herbivora travel long distances to reach salt licks and that the carnivora do not. Even the study of word roots in the most ancient tongues provides evidence that the origin of mankind's use of added salt began with the change from nomadic to agricultural existence; the word for salt is found in primitive Greek, but not in Sanskrit. The Sermon on the Mount reveals that salt was held in high regard in Palestine in the days of Jesus: "You are the salt of the earth, but if salt has lost its taste, how shall its saltness be restored?" (Matthew 5:13, Revised Standard Version). The wide-spread longing for salt is not necessarily proof of a real need; Stefansson found in his

years in the Arctic among the natives, when he lived their lives and ate their food, that the desire for salt as an added item of food actually disappeared in about three months. Nonetheless modern man continues to add it to his diet, and in certain diseased states may suffer a penalty in edema, heart failure and hypertension. Salt is a dietary essential, but there is an urgent need to re-examine man's requirement for it, its evident relation with potassium intake and its native toxicity. We should continue to unravel and establish as precisely as possible the distinction between taste and need.

To date it appears that the average adult American diet provides from 5 to 10 grams of sodium daily without any from the saltcellar and that this amount in the food itself gives all that is needed. If an excess of salt is taken, it does no harm if it is promptly eliminated. The giving of salt, however, can be very dangerous, in fact in the presence of cardiac or renal dysfunction it may be lethal. Following any surgical procedure producing stress there is a transient physiologic salt retention, because of increased adreno-cortical activity. The administration of salt during this period can result in a dangerous excess of salt in the body.

Many damaging factors are operative in causing deterioration of our foods. In their natural states they promote growth and maintain health, but Knight[2] makes it clear that, by *processing*, they are converted into substances that are of poor quality and may even be harmful to the consumers. Owing to ignorance and the greed which has depleted our forests and soils, farm lands and grazing areas have become impoverished, and so their products are now more or less lacking in important food elements. To protect the growing fruits, vegetables and grain, there is now a wide-spread use of insecticides. These are highly poisonous and carry danger to health in ever increasing degree; moreover they tend to contaminate the soil itself to the point of being destructive to essential organisms living in it. Even though good harvests may still be gathered, the grains are almost always processed — for purposes of preservation, of ease of transport and of readiness for use by the housewife with a minimum of labor — so that they are reduced to a state of shocking impoverish-

ment. By this processing, wheat flour loses its endosperm and coating, and thereby is deprived of much of its minerals, B Complex and vitamin E, as well as some of the natural protein contained in the grain. Another processed food, white sugar, is now consumed in an incredible amount in this country, as much as 125 pounds a year per person; the consumer would be far better off if he adhered to the use of natural carbohydrates and sugars, such as whole grain breads, honey and raw fruits. Recurrent tonsillitis, sinuitis and otitis media respond well to such a regime, plus a high protein intake. To the gross abuse of refined sugar is traceable much of the dental caries, found especially in growing children. Better foods will become available only when the public demands them, and it is the physician, regardless of his specialty, who must guide the public to the knowledge of good nutrition.

Modern milling brought in the white, impoverished flour — with its unquestioned contribution to degenerative disease. For those to whom this fact seems of immediate importance and who preach the value of whole wheat and other whole grains, the study of McCance, Prior and Widdowson[3] will add a feeling of assurance as to the value of B Complex in constipation. The brown bread and the white were fed to normal subjects with a small amount of barium in order to follow the sequence. The brown bread required more chewing and took longer to eat. The subjects preferred the white bread at first but came to like the brown bread more and the white bread less. The brown bread appeared to have a more stimulating effect on the saliva and the gastric juices. The gastric emptying time was less for the brown bread. The residue from the brown bread left the colon 24 hours sooner than that from the white bread, probably owing to the bulk of the brown and to the stimulus of the B Complex, which is rich in the whole wheat but removed from the white. The average passage time through the entire gastrointestinal tract was 2.1 days for the brown bread and 3.1 for the white.

Reduced to simplest terms, the cause of obesity seems to be either too great an intake or faulty metabolism. One frequently sees people even grotesquely obese whose eating habits appear to be not unreasonable. The general opinion is that

the moderate amount of food ingested is, owing perhaps to an endocrine lack, not properly burned up and eliminated. In Jolliffe's[4] opinion, however, obesity is invariably caused by a greater intake of calories than is needed. This disproportion is brought about by an abnormal appetite — bulimia. He offers an interesting hypothesis in an effort to explain the phenomenon of appetite. He assumes the presence in the brain of an appetite-regulating mechanism. To popularize the idea, in a book written for the laity he gives it the name "appestat" and represents it as situated in the hypothalamus. This is in line with the present trend of opinion — that the hypothalamus is the controller of many functions, such as the regulation of body temperature, water balance, and sleep. These functions are subject to various disorders, if the centers are damaged by disease; and Jolliffe believes that, like the others, the appetite regulator is vulnerable. He says that 28 per cent of the people in this country are overweight and that, by the age of 50, this is the case in one-third of the men and one-half of the women. Like other habits, that of overeating cannot be changed over night. Old sins cast long shadows.

It seems clear that most overweight persons are not obese as a result of an organic disease and that control of the intake of food is the key problem. Height-weight tables are inadequate and there must be individual evaluation of the patient's physique and history. Why does a given patient overeat and why does he or she wish to reduce? Brosin[5] adopts four categories to explain overeating: *1.* A response to emotional tension; *2.* A substitute gratification in intolerable life situations; *3.* A symptom of emotional illness such as depression and hysteria; and *4.* Addiction to food. It is common for patients to accept a prescribed diet but to cheat without reporting. Social and family pressure favor reducing but often the victim cannot tolerate the loss on account of some inner motivation to be overweight; he might, for example, take this means of avoiding open competition with others, with its accompanying strain and anxiety. Perhaps he wants to go on being lazy. Irritability is fairly often found in patients under a reducing program and if possible good substitutes for the desired food may be furnished by mental and bodily activities.

Obesity is a double handicap to older people; as Keys[6] points out, there is a progressive weakening of their muscles and yet they must move an undue burden of sheer weight. In addition, the so-called degenerative diseases seem very clearly to be promoted by obesity. Nutritional needs of older people, however, are not different in kind but only in amount, from those of younger generations. They need the same foods. The various infirmities associated with old age manifest themselves in different decades, in some persons as early as the 40th year, commonly in the 60's. The basal metabolic rate declines steadily with age, about 3 to 5 per cent a year after age 50. The older person tends to follow the dietary pattern of his community rather than any special pattern of old age itself. If a popular diet in a given region is, for example, conducive to pellagra, then pellagra will frequently be found in the older members of that community. In addition, many are apt to follow the pattern of their earlier years, and not to profit by the advances in nutritional knowledge. Often a fight is necessary to counter the claims of food faddists, purveyors of nostrums and writers who promise miracles from peculiar diets. The primary means of improving nutrition, even with the aged, must be education.

Today, patients are undergoing operations under circumstances in which they would have been declared inoperable only a few years ago. This puts an extra burden on the teams which supply nourishment to the patient and Rhoades[7] states that a good regimen often tips the scale toward recovery in patients who would otherwise be lost. After severe burns the amount of "C" which must be administered to produce an increase in the output of "C" is very great indeed — of the order of 1000 to 2000 mg. per day; furthermore, we have learned that the "C" content of the adrenal is reduced. It is best to give very large amounts of "C" for several days and then to continue with fairly large amounts. The "B" vitamins are important in regulating gastrointestinal function and should be supplied for a period after gastrectomy. "B_1" deficiency is apt to develop during fever and hyperthyroidism; during a thyroid storm, the requirement may go up at least fourfold. "B_2" is apparently deposited in the body during

periods of protein synthesis and excreted during periods of protein breakdown.

During World War II large numbers of Danes, who had taken part in the resistance movement, were sent to concentration camps in Germany. After the war 1300 were repatriated. These men have been carefully examined from time to time, to determine their right to compensation, and Hermann and Thygesen[8] review the latest findings in 120 of them. Lost weight was seldom regained, amounting to one-fifth of the original weight in a few cases. In some, hunger dystrophy from malnutrition caused irreversible changes. Mental deterioration showed itself in impairment of memory and inability to concentrate; the memory of 70 of the men was so enfeebled that they had to write down whatever they wished to remember. In more than one-quarter of those who suffered mental effects, working capacity was found to be progressively impaired.

Although our chief aim is to present what tends to improve nutrition, it is not unfitting to see what can happen from the misuse of one of the great factors, vitamin A. A patient, whose case is described by Gerber, Raab and Sobel,[9] when in her 20's began the use of "A" to combat ichthyosis and continued to take it for nine years in prodigious amounts, reaching 500,000 units daily. Her suffering from effects of this record-making ingestion of "A" led her to five hospitals; she had severe headache, serious eye trouble in the form of diplopia and blurred vision, skeletal rigidity, decalcification of some bones and exostoses of others, and incontinence of urine. Her headache was of a degree to lead to a diagnosis of serous meningitis and a right subtemporal decompression was performed. Her course was ever downward. Only on her last admission was the significance of her "A" addiction recognized; her fasting blood level of "A" was about 40 times the normal. Withdrawal of "A," except as part of the usual diet, was followed in a few weeks by marked improvement — entire loss of pain, clearing of her intractable itching, restoration of vision, loss of diplopia and the return of more nearly normal posture and freedom of movement.

An obvious inability of the geriatric (or any) patient with achlorhydria to digest, absorb and retain proteins prompted Sharp[10] to determine a person's ability to absorb protein through the use of a tagged protein feeding material — a preparation of yeast which had been tagged with nitrogen. In a carefully controlled study, patients were hospitalized and their excreta examined spectrographically. Lack of protein absorption in the geriatric patient is one of the most important causes of senile tissue changes, particularly of the skin and mucous membrane. Abnormal states in these tissues may well have a bearing on tumor formation. This study has also suggested a possible method in stopping the growth of human cancer — by "induced abnormal protein synthesis." Complex chains of organic matter make up protoplasm, which is the name given to "living" tissue. Protein elements are the main constituents of these chains. When growth or repair is required, these complexes must be duplicated. This process is called protein synthesis. The current concept of the mechanism of this process is that when a cell manufactures a new protein complex, either for growth or for repair, an already-existing chain of protein elements must serve as a model, or "template," for the orderly construction of the new, or duplicate chain. Thus nature provides a "jig" for the mass production of the complicated sub-assemblies that make up life. The plan behind the experiment is that a tumor can be induced to assimilate a protein sub-element which has been distorted by the introduction into its chemical structure of an *unnatural* amino acid. The template, or jig, thus produced within the tumor cell would not then readily serve as a model for the construction of further protein elements made of the natural nutrients found in the human body. Thus the structure of material within the tumor cell could be so altered that it would lose its capacity to reproduce — and in this way its growth might be stopped.

In his account of experiences as Senior Medical Officer of a large whaling fleet in the South Atlantic, Robertson[11] makes a contribution to our knowledge of nutritional sources, purely incidental to his general tale. Among the products of the whaling industry are soap, magarine, cattlecake, fertilizer that enriches our wheat, feed for chickens, vitamins, glaze on pho-

tographs, oil for watches, the tan on our belts, as well as over 70 different pharmaceutical preparations in common use.

The study of nutrition has at last caught the attention of many in the medical profession and there is no question as to the interest shown by the patient, who has a deep concern in getting advice about what he should eat and what he should avoid. This interest on the part of the public finds a response in popular magazines. In an article written for the lay reader, "Bread from the Sea," Davidson[12] narrates the story of an intensive study in many parts of the world of the unicellular alga as a potential, already an actual, source of food. From the University of Maryland, an estimate of land productivity for three important foods furnishes these data: In one year, per acre, beef production is less than 250 pounds, soy beans less than half a ton and algae 40 tons. Thailand collects plankton — algae and other small marine life — from adjacent seas, a harvest of 5000 tons a year. Japan's leader in this study, Hiroshi Tamiya, at the Carnegie Laboratory at Stanford University, recently demonstrated the suitability of algae for food in many acceptable forms. They taste good, too. The University of Texas has done important work in the selection of particular species of algae. Their rate of growth is amazingly rapid and the product is of high value in proteins, fats, starches, vitamins — in fact every food component needed to sustain life. Sunlight, carbon dioxide and minerals found in soil are worked upon in this microscopic food factory at small cost. Like all protein foods, the output spoils easily and for this reason it is usually dried to a fine powder which can be stored indefinitely. In Venezuela in a leper hospital patients were fed for four years with "plankton soup" in the hope of its having some curative value; while this hope was not borne out it proved to be a good food. In this study there is a reasonable prospect that the hungry areas of the world will find the solution for their problems of food shortage at small expense.

To keep pace with the increase in world population, this pressing need of increasing food production was the subject of discussion in the House of Lords[13] recently. Only 100 years ago the world population was a mere billion. Now it is two

and one-half billion and in 70 years will probably double itself to five billion. Areas under cultivation must be extended and new fields of production explored. Plankton can be harvested in unlimited amounts from the sea and become an important source of protein and vitamins. Chlorella, a green alga, is already under scrutiny in the United States as a rich source of vegetable protein. Of course, when any radical change in a nation's habits is proposed, social, religious and economic obstacles are to be looked for, especially in some Eastern countries.

2. ENDOCRINE.

Stating that the recent advances in Endocrinology have markedly changed our concepts, Goldzieher and Goldzieher[14] have brought out a book to which many scholars have contributed. All speak of the wealth of new information and the variety of potent therapeutic agents. Until recently endocrine therapy has been considered useful when it overcame a deficiency; unless a deficiency was demonstrable, the use of hormones was considered to be unwarranted. This has been the prevailing viewpoint, even though everyone, especially the otolaryngologist, has been familiar with the local use of epinephrine; also all have known of the use of insulin in the treatment of certain mental diseases; however, with the advent of cortisone and ACTH there has been a radical change in attitude. These hormones are now used freely in a great variety of diseases in which there is no demonstrable hormone deficiency at all. In fact, cortisone and ACTH are in common use on an empirical basis, like quinine or the salicylates. Hormones are known to alter or influence specific phases of metabolism; if such changes are desirable, a hormone is indicated. For example, if one intends to promote an increase in anabolism (protein synthesis, formation of new tissue), androgenic steroids may be used, without regard to the patient's sex or gonadal status. The contributors to this book, in their respective fields, draw on special experience; in the following paragraphs, examples give an idea of its extent and worth.

Shelton and Skeels[15] note that a spurt in growth of three to four inches is usual at puberty, when primary and secondary sex characteristics begin to develop because of the increase

in the secretion of gonadal and adrenal steroid hormones. Skeletal growth usually terminates by the 17th year in the female, while in the male it may continue to the 21st year. Underfed children fail to grow normally, but they are only moderately shorter than the average. A high caloric, high protein diet is at once essential. Testosterone in small doses is probably the best anabolic stimulant. In boys a dose of 10-15 mg. daily is often sufficient to produce remarkable nitrogen storage and linear growth. If the judicious use of testosterone for two or three months is alternated with similar periods of rest from treatment, there is little danger of causing premature epiphyseal fusion. Serial "bone age" determinations should be performed, and the androgens should be discontinued when the bone age is brought up to normal. In girls, androgens, if used at all, should be employed cautiously; the danger of irreversible virilization is always present; however, estrogenic preparations given concomitantly usually obviate or at least minimize the untoward androgenic effect. Small doses of globin insulin frequently stimulate the appetite. * * * As to the thyroid, most hypothyroid children are not frankly obese, and it is perhaps for this reason that many cases are overlooked. Bone age is retarded, especially in the hips. Mild cases may be difficult to diagnose; however, if the serum cholesterol is elevated and then falls 30 per cent and stays down during thyroid administration, the diagnosis is established. Rapid development can occur after adequate treatment of the severely hypothyroid child.

Senescence on the other hand presents a very different picture. The problem of aging seems to Goldzieher and Goldzieher[14] to have two aspects: The inevitable changes and also those that are amenable to medical approach, as in any other degenerative disease. The advanced state of senescence may be out of all proportion to the age of the patient; the removal of debilities may lengthen life. The few facts available indicate that aging is associated with chemical changes which affect the whole body and all of its cells. Studies with isotopes have shown that throughout life the cells turn over their atomic constituents far more rapidly and more completely than one had imagined. In addition to the turnover on the atomic level, a continuous and rapid change also takes place

on the molecular level, in the two antagonistic phases of catabolism and anabolism. In the young these two processes are well balanced; in old age, there is a definite decline of both, but the decline of anabolism predominates. The chemical constituents are not replaced at the same rate as before. The difference is not only in speed but in quantity — hence the body substance decreases. It is well-known that the size of the heart, liver and kidneys decreases in the aged. The thyroid and the gonads decrease in size and in secretion; the function of the pituitary and adrenal glands is diminished to a lesser degree. The decline of testicular function is confirmed by the decreased urinary excretion of the 17-ketosteroids. About one-third of the 17-ketosteroids come from the testicle and two-thirds from the adrenal cortex. Testosterone and, to a less extent, estrogen retain tissue nitrogen and help to build proteins. Both retain water in the tissues and affect the calcium metabolism and the mineral content of the skeletal system. Even the central nervous system is under the influence of the gonadal hormones and strongly reacts to their absence. It would seem that the prescribing of androgen ought to be of value in arresting the process of decline; the soundness of this assumption seems to be corrobated by clinical experience. Giving of androgen, especially testosterone propionate, in the aged, both male and female, causes a prompt increase in body weight, a gain in strength and vigor and a sensation of well-being. In the female, testosterone must always be accompanied by a commensurate amount of estrogen to prevent symptoms of masculinization; the dosage of the testosterone must be lower than in the male — usually one-half the amount. On the other hand, the amount of estrogen should be increased over that given to the male. Special geriatric preparations now provide estrogen-androgen doses combined with vitamin and mineral supplements. Hormone therapy in senescence cannot exert its best effect unless the nutritional requirements are adequately maintained. It is often better to advocate frequent small meals than fewer large ones. An adequate intake of calcium is desirable in view of the tendency to develop osteoporosis in the aged. Milk is an excellent source but if the necessary one or two glasses of milk a day are not consumed a substitution can be made by using

one of the common calcium preparations. The response to adreno-cortical extract is better if given jointly with substantial amounts of vitamin C and the B complex.

3. AUTONOMIC.

Since the human body is a unified organism, it cannot have several independent master controls. The endocrine axis has its many actions controlled from the pituitary. In turn the target glands modify the activity of the pituitary. But where is the primary instigator of pituitary function? One school of endocrinologists has suggested that the system is self-sufficient, without domination or control by any mediator outside its own circle; however, the principle of unity is once more confirmed by recent work that integrates the humoral (endocrine) and neural adaptive mechanisms of the body.

The basal nuclei of the brain principally found in the hypothalamic area, have for a long time been recognized as the control center for neuromuscular, neurovascular and neurosecretory functions. Porter[16] has now demonstrated changes in electrical activity in the hypothalamus in response to systemic stress.

When ACTH stimulates the adrenal cortex, circulating eosinophiles are markedly reduced in number; this is the basis of the well-known Thorn test. Hume[17] has shown that electrical stimulation of the hypothalamic areas induces eosinopenia, suggesting activation of the pituitary to produce ACTH. Production of eosinopenia by pituitary response to adrenalin injection can be prevented, if these hypothalamic areas are detroyed. These experiments demonstrate, then, that an intact hypothalamus — particularly the posterior portion — is essential to the production of normal endocrine (pituitary — adrenal) response to stress. Thus the endocrine system is not independently activated; its function can be stimulated or prevented through basal nuclear (hypothalamic) action. Hume also suggests that afferent somatic and autonomic nerves coming from the region of body stress may activate the basal nuclei to drive the pituitary into action. He also suggests that chemical substances produced at the point of body injury (stress) may be carried through the circulation to the hypo-

thalamus and thus stimulate the basal nuclei to prod the pituitary. He contends also that neural pathways (association bundles) from higher cortical centers can activate the hypothalamus to the production of pituitary axis activity. For example, electrical stimulation of the prefrontal cortex can produce eosinopenia.

Porter[18,19] has further shown the intimacy of the autonomic centers and the pituitary axis, by demonstrating that adrenal hormones can modify the responsiveness of the hypothalamic areas to stressful stimuli.

Thus, the higher emotional centers, the autonomic centers of the hypothalamus and the pituitary-governed endocrine system *cooperate* to effect humoral and neural control. The basal nuclear area is the central switchboard. Autonomic dysfunction and endocrine imbalance are integrated disturbances, so their clinical similarity is understandable.

4. STRESS.

In opening a symposium on Stress, shared by other recognized leaders in this field, Selye[20] reviews his work of the past 18 years. The body's response to stress, caused by a wide variety of factors, is specific when it combats infection, trauma and the like; it is non-specific when (to borrow the language of the physicist) the body is subjected to pressure and tension. Selye confines his discussion to the latter conditions. During the reaction to pressure or tension, the outstanding manifestations are adreno-cortical enlargement in contrast to involution or degeneration of other organs; in fact, the adrenal cortex appears actually to flourish on stress. This useful role in the body's non-specific adaptation is what Selye calls the "alarm reaction." The general adaptation syndrome comprises three distinct stages: *1.* The alarm reaction; *2.* The stage of resistance; and *3.* The stage of exhaustion. His concept is that there are many diseases that have no single cause, no specific pathogen, but are largely due to non-specific stress. His early work was carried out with crude glandular extracts; later research by many workers, notably the classical investigations of Kendall and Reichstein, identified and purified the many hormones involved and defined their functions. Selye's

introduction is followed by studies of stress reactions observed by the other contributors; these relate to the various body systems and to the problems that confront the pediatrist, the psychiatrist and the clergyman. One contributor lightens an otherwise somewhat ponderous subject, to extol the Importance of Leisure; Ogilvie[20] unashamedly narrates how, in his schooldays in England, his father expressed concern lest he be overworking, but his anxiety was allayed by the headmaster's assurance that "your son has a remarkably well-developed protective instinct." The lesson learned from long experience is that "the best way to prevent stress is not to suffer it." Man, alas, knows too much for his peace of mind. When danger is upon him, he faces it and calls up all the autonomic and endocrine mechanisms that can protect him; but, unhappily, he is not always able to dismiss them when the need is over.

In a well-planned endeavor, seven physicians in general practice, Finlay, Gillison, Hart, Mason, Mond, Page and O'Neill[21] assemble their experiences in "stress disorders"; their fields of practice range from the congested areas of London to the rural communities of England. About one-fifth of all patients seen on any one day in urban practice suffer from stress and even in the country the proportion is one to ten. The greatest difficulty in appraising the many factors that combine to cause symptoms is, in their panel practice, the lack of sufficient time; nonetheless this symposium represents an agreement on diagnosis and classification, reached only after careful discussions. In the experience of Gillison, there are three classes of stress disorders: 1. Phobias, such as fear of tuberculosis or cancer; *2.* High strung personalities, with inner conflicts but no particular anxiety revealed; and *3.* What may be called "moral stress." Mason finds stress syndromes to be common, such as tiredness, headache, fear of cancer or heart trouble or appendicitis, seborrhoea, peptic ulcer, localized pain in this or that region, diarrhoea and night sweats. This study indicates that of all the different causes of unhappiness and inefficiency, psychosomatic illnesses are probably the greatest.

In their book, Holmes, Goodell, Wolf and Wolff[22] give an

exhaustive study of the functions of the nose, particularly of the erectile tissue of the turbinates and of the tubular serous glands which abound in the lining membrane. Color changes of the mucosa are evidence of variations in the flow of blood and vary from pale yellow-red to deep cardinal. They may accompany bodily exposure to temperature changes such as chilling or overheating. They loom large in the special field of external psychic pressures; local reactions in the lining membrane of the nose result from a wide range of such emotional tensions. The authors present very detailed histories of their patients and their individual nasal reactions to anxiety, remorse, frustrations, social and familial maladjustments and conflicts, tension in business relations. Nasal obstruction, in fact, constitutes a part of a defense reaction against unwelcome or threatening situations. This demonstrates that the pathogenesis and the treatment of chronic nasal congestion with which we deal every day, present a medical problem in a very broad sense. Rather than limit our effort to what Pierce[23] called "manicuring the nose," we recognize that these conditions respond in the long run to treatment based upon a discerning diagnosis.

5. ALLERGY.

Tantaque in his rebus distantia differitasque
*Ut quod ali cibus est aliis fuat acre venenum.**

The old aphorism, "One man's meat is another man's poison" can be traced to Lucretius[24] in the first century B.C. True appreciation of the importance of inhalants took shape in the 16th and 17th centuries. Brown[25] pays a high tribute to the shrewd observations of Morell MacKenzie, who in 1854 laid the blame for seasonal hay fever on pollen, for asthma on lycopodium and animal emanations, for coryza on house dust, tobacco smoke and grease fumes. MacKenzie's "idiosyncrasy" became in 1906 von Pirquet's "allergy," although the underlying problem remained unsolved. Even as late as 1905 most physicians believed allergic disorders to be due to bacteria. An early champion in the fight against pollen sensitivity was Brown's own teacher, John Freeman of London,

* In these matters there are differences so great that what is food for one man is for others rank poison.

who in 1911 began the use of injections of timothy pollen extract for hay fever. Manifestations of allergy in fields other than respiratory became better and better recognized in the latter half of the 19th century. Angioneurotic edema was defined by the German, Quincke and others; anaphylaxis by Flexner and Richet; food allergies by many observers, especially during the past 50 years; atopic eczema by Walker in 1917. Epinephrine was first used in 1903 as a means of controlling bronchial asthma; ephedrine came into general use in 1917 and has in its train the many synthetic compounds; in 1935 aminophyllin was introduced; the antihistaminics in 1939 and, most recently, ACTH and cortisone. Brown speculates that the major discoveries are still to be made and wonders what will happen to Allergy in the next 20 years.

It is important to the physician to detect if possible which of his patients have allergic sensitivity, either as a major factor or as a minor, and it is estimated by Kern[26] that of all patients, one in seven will at some time have a major allergic disease, and one in four will have a less severe, probably more obscure allergic reaction. Evidently, allergy covers a large part of any medical practice. Allergy may give rise to a host of symptoms and in many parts of the body. In the same patient, sensitivity to one allergen may diminish and reaction to another may develop. Allergy may affect one organ at one time and another at another time. These patients do not inherit an allergic disease but a capacity to be sensitized to things more easily than are other persons. They are born that way and remain so until they die. The defect does not change; it is the sensitivity pattern that changes. Old sensitivities may be lost and new ones may develop. Different parts of the body may become new shock organs, while parts once sensitive may lose their reactivity. The number and potency of allergens are on the increase, as found in the use of many of our new and most helpful remedies, such as certain antibiotics. The best way to learn which patients are sensitive is simply to ask them. "It takes the women to remember that a great-aunt got hives from Jerusalem artichoke." If the family history is positive, the patient could be allergic; if the personal

history is positive, he is allergic. Eosinophilia suggests allergy; its absence does not rule it out. The syndrome of Meniere includes a fair proportion of allergic nature; the middle ear also may suffer from allergic edema. Psychic factors may pull the trigger, but they do not load the gun; one does not see an asthmatic in whom only psychic factors are present. Except in rare instances, the allergic factor is preponderant. For asthma, one should not give drugs that cut down an already scant sputum, such as atropin and antihistaminics; doing so can cause death. Opiates, unwisely given, are still the commonest cause of death in asthma. All chemotherapeutic agents are potential allergens. Each one as it appeared was hailed as low in toxicity and of neglible allergenic significance, only to prove quite the reverse when lapse of time had permitted its second and later courses in patients. Penicillin is no exception; a score or more of sudden deaths have been reported. Often, if the patient demands an antibiotic for a minor ailment, one may mollify him by saying, "Don't shoot sparrows with a 16-inch gun." If the reaction to a drug persists unduly after its use is stopped, and especially if there develops a rising eosinophilia, there is the threat of periarteritis nodosa; this calls for the immediate use of cortisone. Corticotropin and cortisone are only palliative in allergic states; there is no diminution in the underlying sensitivity. Prolonged use of corticotropin is followed by hypoplasia of the pituitary and hypertrophy of the adrenal glands. When treatment is stopped, the pituitary regains some, but not all of its loss after months, while the adrenal glands shrink to less than their former size. Prolonged administration of either drug leaves the patient worse off than when he started.

Twenty-three allergens are named by Sheldon, Mathews and Lovell[27] as their choice for routine survey. They give a solemn warning of the dangers of the intracutaneous procedure and dwell on the absolute need of a prior scratch or prick testing; eight allergens are properly called "explosive," because they have caused fatalities when used intracutaneously — mustard, cottonseed, flaxseed, ginger, buckwheat, mushroom, sea food and nut meats. All the deaths occurred when the intracutaneous tests were performed without prior scratch or prick testing. Sensitivity to a food can often be determined

merely by attention to a patient's story; in cases where the history is not clarifying, one can best depend upon the trial-and-error method — elimination diets. In general, skin tests are not reliable for foods.

Reactions from penicillin have been reported from several sources in 1954. Farber, Ross and Stephens[28] sent out questionnaires to California physicians and received over 1000 replies; the data thus gathered show more than 520 moderate reactions to penicillin and over 300 severe reactions with 7 of them fatal. The antibiotic is believed to unite with the serum proteins to form antigens; the patient is thus rendered vulnerable to a subsequent injection of the antibiotic which sets free in the blood stream histamine or histamine-like substances, and the end result is shock. Experimentally, ACTH has been used to avert shock in guinea pigs; given one hour before injection of an antigen, it diminishes or inhibits shock, but, if given when a reaction is manifest, it is valueless. For the past two years Farber and his associates have combined with the antibiotics one of the antihistaminic drugs — benadryl, pyribenzamine, histadyl or chlortrimeton. In more than 3000 injections no severe anaphylactic reaction has been observed. Evidence of shock calls for vigorous handling without delay — epinephrine by intramuscular injection, an antihistaminic drug by intravenous route and oxygen administered under pressure to avert pulmonary edema. One of us (J.A.H.) finds that prolonged infusion of hydrocortone in an intravenous vehicle is also effective and may prove superior to any of the others.

That alarming reactions can follow the use of even minute amounts of penicillin is shown by Carter and Cope.[29] In 1946 and 1953, a nurse had had injections of the drug for congenital syphilis and bronchitis. After the second event she noticed wheezing and later a rash. Three months after this second treatment she merely applied penicillin ophthalmic ointment to one eye. A reaction followed speedily — shortness of breath, flushing of the face and abdominal cramps. However, epinephrine, phenobarbital, atropin and pyribenzamine brought relief of the symptoms.

The Chief Medical Examiner of New York City lists eight

cases in which the injection of penicillin was followed by sudden death. In no instance was there evidence that the drug had entered a blood vessel. Rosenthal[30] pleads for discrimination in its use and a careful search for a history of any previous unfavorable reaction, pointing out that reactions occur after the use of penicillin by any route, not only the intramuscular.

A helpful classification of allergic diseases is offered by Coca,[31] who considers that five categories are distinguishable. *1. Atopy.* This group includes bronchial asthma, hay fever and infantile eczema; it is the hereditary character which unites these conditions in one group and separates them from the other categories. *2. Allergy of infection.* There is a lack of the familial character; the sensitivity is established merely by the infection, such as the pathogenic fungi and the viruses. *3. Serum disease.* This is regarded by many as the clearest example of anaphylaxis, a specific reaction in which injected foreign serum becomes an antigen. *4. Contact dermatitis.* The familiar example is that caused by poison ivy. The numerous excitants of this condition are all non-antigens; no protein excitant has been encountered. The sensitivity seems to be limited to the cells of the epidermis; the intracutaneous test with the excitant results negatively. The oily excitant of poison ivy has been extracted and solutions of it given, by injection and orally, in an attempt to bring about a lessened sensitivity. *5. Idioblapsis; familial, non-reaginic food-allergy.* This is the unusual approach offered by Coca. To signify a food-allergy in which antibodies (reagins) can not be demonstrated and in which food extracts do not produce skin reactions, he adopts the word "idioblapsis" (Greek, *idio,* personal and *blapsis,* a spoiling or damaging). Tachycardia, following ingestion of a food, is the specific reaction of this "familial, non-reaginic" allergy; Coca affirms that this is a means of positive identification of a food allergen. The procedure he has adopted calls for a pulse-record for a few days before the test; the pulse rate is recorded before rising, before each meal, and three times after each meal at 30-minute intervals. The foods to which most allergy patients are sensitive are wheat, milk, egg, potato and meat. Each test calls for only one article of food at a time — small meals, five in one day.

If relative tachycardia occurs, it is of course necessary to wait for its cessation before proceeding with another test. Being one of the most valuable foods, milk is one of the first to be tested; if no sensitivity is shown, milk may be taken freely with a food subsequently tried. In this way, one food after another may be tested, one at a time.

In a lay magazine Cronin[32] gives a useful summary of the problems of allergy. Except for his definition, "hypersensitivity of the body cells to various substances, otherwise normal, which act as irritants on particular individuals," he uses medical terms sparingly yet covers the field well. He gives due place to reactions associated with psychosomatic factors. He cites cases of allergic reactions to foods, inhalants, clothing, even glue on postage stamps. A striking instance is presented of a priest who for six years had had periodic attacks of sneezing and coughing which at times would develop into a two-minute fit of choking; wine which the priest drank at Mass proved to be the excitant, and attempts to give him tolerance for wine failed.

GENERAL.

In our specialty there are many who feel that we should grasp any opportunity to catch a glimpse at what is going on in modern medicine. As Garland[33] expresses it, medical progress has surged onward through the ages, despite such delightful lapses into complacency as that of Ambroise Paré — he who dressed the wound that God might heal it — when he wrote in 1575: "God is my witness * * * that I have labored * * * to throw light on the art of Surgery and bring it to perfection. And in this labour I have striven so hard * * * that the ancients have nought wherein to excel us, save the discovery of first principles; and posterity will not be able to surpass us * * * save by some additions, such as are easily made to things already discovered."

In a survey such as this, there is an immediate satisfaction when we can provide facts and "prescriptions" that may be promptly applied in the office and the hospital. However, such articles are not found in abundance; besides, surely there is information, not yet applicable to practice, with which we

would do well to become familiar. Many of the following articles have no immediate bearing on clinical practice, but they are made available for the earnest student interested in basic facts that affect the health of the structures with which we are directly concerned.

Progress may come from suggestions that at the moment seem to lead nowhere. Such an idea is in line with what DuBridge[34] so neatly calls the importance of being *impractical.* Although he holds a torch for knowledge for its own sake, he particularly exults that sooner or later it becomes applied in a most practical way. With the use of steam came the Age of Power; lumps of coal then became man's "black slaves." For ages the world did not change much from one generation to the next; now it hardly stays recognizable for ten years at a stretch. To DuBridge, men had not become more intelligent, but had found a new process of thinking, by observing, deducing and predicting. It is called "Science." A searcher in the chemistry of living things might not be working on a cure of any disease at all, but yet, to his surprise, make a great discovery — penicillin — helpful in many diseases. As Louis Pasteur expressed it, "In the fields of observation, chance favours only the mind which is prepared."

Some day we shall better understand the nature of the protein, its function as a bulwark against infection, the uses of the isotopes, how a cell can reproduce itself, and the complete story of a virus.

* * *

Knowledge of life processes has increased during this century, but many signs indicate that a golden age is only now beginning.[35] Chemical biology has already produced or identified the physiologically useful vitamins, hormones and antibiotics. It has brought the theory of the gene to the point where we understand the basic differences between living and non-living systems. In 1951, Pauling and Corey[36] reported the atomic structure of proteins found in bone, muscle and red blood cells. Proteins are responsible for many of the activities that we associate primarily with living things; in this respect they may truly be considered more important than

any of the other components of living cells. The major components of skin and muscle are proteins; so are the major components of hemoglobin and the antibodies found in the blood. The first straight advance toward an understanding of protein structure was made in 1900 when Emil Fischer found that a protein molecule is composed of simpler substances, amino acids.

How proteins are put together from the elements is still a baffling problem and no one can bring to us the full meaning of the proteins better than Albrecht.[37,38,39,40] It seems to him that we have given little thought to the concept that plants are struggling to *make* their necessary proteins, just as animals are ranging far and wide to *collect* theirs, and that healthy man eats food of all types — in facts needs to be highly omnivorous, and that all these efforts have the purpose of making sure that each form of life is getting the required amino acids. Much has been learned about the chemical structure of proteins and yet we do not know how nature starts with the separate elements — carbon, hydrogen, oxygen and nitrogen — and builds an amino acid. Of the amino acids, eight are essential for man if he is to live. How sulphur and phosphorus are put into protein molecules is another unsolved mystery. We are able to separate a protein into its amino acids and then further separate them into their chemical elements, and yet we have found no clue to the processes by which nature puts them together to *produce* a protein. Plants first make carbohydrates — by photosynthesis; then, if the necessary elements are available in the soil, they apparently convert the carbohydrates into amino acids — by biosynthesis. The amino acids then hook together to make proteins.

The body's store of protein constitutes a bulwark against infection. Depletion of this store of protein increases the danger. Cannon[41] finds that rats and rabbits on diets that severely reduce the protein, exhibit a decreased capacity to form specific antibodies. These animals, however, quickly regain their normal capacity to synthesize antibody-proteins when fed a diet containing an adequate amount of high-quality protein. Protein-deficient animals display a decreased resistance to experimental infection; there is a marked atrophy of bone marrow. For such depletion of the protein stores and

for such diminished functioning of the tissues producing antibodies, a considerable period of time is required. In the broad field of communicable disease it is *acquired* immunity which decides the outcome of any grave infection. Thus the immunity of the newborn is due not so much to the forces of natural resistance as to the transmission of protective antibodies from the mother. From a few months after birth and throughout life, defense against infection depends largely upon one's ability to acquire immunity. Immunity to infectious disease is acquired by recovery from the disease, or by vaccination, or by subclinical doses of the causative agent. Acquired immunity, however, is always relative and tends to vary in degree in accordance with the capacity of the tissues. Antibodies cannot arise, presumably, if there is a lack of available building material, or if there is deterioration of the cells which produce them. Antibody-production may be influenced by the availability either of constructional materials or of activating agents, such as the enzymes, vitamins and salts. Furthermore in the course of infection, specific antibodies continuously combine with a multiplying antigen or its products, become expended, and need to be renewed as the infection progresses. Consequently, in order to function adequately, immune mechanisms must be able to fabricate antibody-protein uninterruptedly. In other words, the overall process of antibody formation must be looked upon as dynamic and progressive. The primary absence of a vitamin may block the process of antibody formation even though the amino acids necessary for the synthesis are available.

Studying the relationship, Cannon[42] also speaks of a nicely balanced or steady state, a dynamic equilibrium, between the protein in the tissues and the protein in the plasma. It is well known that during digestion the amino acid concentration of the blood may show a considerable rise, followed by the rapid removal and destruction of these amino acids by the liver. Some amino acids, however, pass through the liver; and in the fasting animal the amino acid concentration in the tissues may be as much as ten times that in the blood plasma. Soon, however, the concentration reverts to its regular level, as equilibrium with the blood is re-established.

Dulbecco and Vogt[35,43] have developed a technic for study-

ing viruses that attack animal tissue — those that cause smallpox, herpes, influenza and poliomyelitis. Formerly, they could be studied only by the slow and expensive process of infecting monkeys or chicken embryos. The new technic is to grow a single layer of animal tissue cells in a nutrient medium in a small dish and then to add a liquid containing virus particles in a weak suspension. As each particle of virus attacks the tissue cell it will multiply and produce a small visible area of dead cells. Thus the number of virus particles in the original suspension can be counted and the progeny from any single virus can be "bred" for further study. By applying this technic it became possible for the first time to isolate genetically pure strains of each of the three known types of polio virus. This means that it is now possible to start intensive studies of the development and hereditary properties of each virus.

How does a living cell reproduce itself? Commoner[44] conducted an experimental attack on this key problem in biology. What is this biochemical process — the fundamental basis of all reproduction? Tobacco mosaic virus offers special advantages for his experiment. When a very minute amount is inoculated into a tobacco leaf, large amounts of new virus soon appear. The flowers produced are streaked, instead of showing normal solid color; the shape and the color of the leaves are also affected. This particular virus can be taken out of the infected cell and isolated as a pure single substance, a nucleoprotein. It can be kept in solution for years and, most important, will still be capable of reproducing itself if put back into a tobacco cell. In brief, it can be taken out of the cell, handled as a mere chemical, and later put back into a new cell without losing its biologic powers. The fundamental approach was to compare the biochemical process in otherwise identical pieces of infected and uninfected tobacco leaf. It was found that the new virus formed in an infected cell is made from the simplest form of nitrogen, ammonia.

Being Director of the Isotopes Division of the Atomic Energy Commission at Oak Ridge, Tennessee, Abersold[45] can speak of isotopes with authority. He reviews the history of their medical use, from the discovery by Curie and Joliot that

ordinary elements can be rendered radioactive, to the present time when 300 labeled compounds are available. He lists six now in common use for diagnosis and treatment; radioiodine 131 and radiophosphorus 32 are the ones most widely utilized. Recent developments in technics and instrumentation have materially advanced the exactness of localization; he cites the use of diiodofluorescein in the mapping of the boundary of brain tumors. In therapeutic applications, on the contrary, radioisotopes are used only as an adjunct to other means of radiotherapy or chemotherapy. As tracer atoms, however, radioisotopes are unique. It seems certain that their extended use will contribute richly to medical advancement.

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MEETING OF THE GEORGIA SOCIETY OF OPHTHALMOLOGY AND OTOLARYNGOLOGY.

The Georgia Society of Ophthalmology and Otolaryngology will meet March 11 - 12, 1955, at the General Oglethorpe Hotel, Savannah, Georgia.

The speakers will be: Dr. Francis H. Adler, Philadelphia; J. W. McCall, Cleveland; Dr. J. A. Hilger, St. Paul; Dr. Walter H. Fink, Minneapolis; Dr. James H. Allen, New Orleans; and Dr. P. E. Ireland, Toronto, Canada. For further details, address Alton V. Hallum, M.D., Secretary, 245 Doctors Bldg., Atlanta 3, Ga.

AN EVALUATION OF CERTAIN THERAPEUTIC AGENTS AND PROCEDURES IN THE TREATMENT OF ACUTE DIFFUSE EXTERNAL OTITIS.*

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and

A. V. HARDY, M.D.§§

INTRODUCTION.

Otitis externa is an acknowledged problem of military personnel serving in tropical or semi-tropical climates. It is particularly disabling to those whose duties require the use of ear phones. Thus, acute diffuse otitis externa, the most prevalent variety, has been of special concern to the Air Force, and the study of this disease has had active support from that Service.

Early investigators believed that diffuse external otitis,[1] variously termed hot weather ear, desquamative external otitis, fungous ear, tropical otitis externa, and furunculosis, was due to a mycotic infection. Later, Greaves,[2] Syverton, *et. al.*,[3] Senturia,[4] Singer, *et. al.*,[5] and others, performed bacteriologic investigations of the flora of the external ear and demonstrated that a high percentage of these cases showed a Gram-negative bacillus, predominantly the *Pseudomonas aeruginosa*.

* These studies were performed under Contract AF 33(038)-28643 with the USAF School of Aviation Medicine, Randolph Field, Texas, and the Dept. of Otolaryngology, Washington University School of Medicine, St. Louis, Missouri, and Contract AF 33(038)12465 with the Bureau of Laboratories, Florida State Board of Health, Jacksonville, Florida.

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Recent efforts have been directed toward eradication of this organism from the ear canal.

Over the last few years, clinical, chemical, and pathologic studies of otitis externa have been conducted in the Department of Otolaryngology of the Washington University School of Medicine, St. Louis, Missouri, with assistance from the Air Force. That portion of the study which was concerned with an evaluation of therapy was handicapped because of the lack of any substantial number of cases in the St. Louis area which could be carefully supervised and controlled.

The laboratories of the Florida State Board of Health, also with support from the Air Force and with the active cooperation of the Naval Air Base, Jacksonville, Florida, conducted preliminary observations on the therapeutic response of patients with external otitis to anitibiotic and chemotherapeutic agents.[6] The need for detailed clinical data was evident, and the sponsoring Service was urged to assign an experienced otolaryngologist to the study. The suggestion was made that the above two groups collaborate in 1953 in an evaluation of selected therapeutic agents and techniques. The proposal was readily endorsed by the investigators concerned and by the medical staff of the U.S. Naval Air Base, Jacksonville, Florida, where studies were to be conducted. The work began in June, 1953, and continued for the next five months, a period of high incidence of otitis externa.

PROCEDURES.

The clinical studies were planned and supervised by one of us (B.H.S.). A medical officer and otolaryngologist (R.J.C.), assigned on temporary duty from the School of Aviation Medicine, was in continuous and full-time charge of the clinic. A recorder, assigned by the Navy, and two medical students worked under the supervision of the otologists. All bacteriologic studies were conducted in the laboratories of the Florida State Board of Health (A.V.H., Director). Statistical analyses were handled through the Bureau of Vital Statistics of the Florida State Board of Health.

All military personnel reporting to general sick call at the Naval Air Station Infirmary and the Naval Air Technical Training Center with symptoms suggestive of ear infection

were sent to the ear clinic. A small number of civilian employees and dependents of military personnel were also examined and included in this study. Every patient was screened by the otologists and, if found to have acute diffuse external otitis, was included in the series. Patients returning with exacerbations were considered new patients only if the ear not previously infected was involved.

On the initial visit, the case history was obtained by the recorder and noted on specially designed history forms. On each return visit, the presence or absence of specified symptoms and findings were recorded on a follow-up form. These data included the usual facts as to age, sex, occupation, as well as number of previous infections, dates of swimming, presence of excess wax, itching, and fullness of the ear canal.

The otologists examined all new patients and those ready for discharge and supervised the taking of cultures, irrigation of ear canals, and the dispensing of medications. Daily records of his findings on patients undergoing treatment were maintained. The degree of severity of particular symptoms or findings was indicated by a score ranging from a minimum of 1 to the maximum severity of 10. Since the examinations were made or checked by the otologists, a reasonable consistency in grading may be assumed. To avoid bias, the observations were completed before referring to the therapy prescribed in the particular case. The recorded data included pain on manipulation of the auricle, degree of erythema, amount of edema up to obliteration of the lumen of the ear canal, cellulitis, nature of the secretion, and evidences of drug sensitivity. At the conclusion of the initial visit the over-all picture of the disease was evaluated and recorded by the otologists as mild, moderate, or severe.

In all cases, the basic treatment included the removal of exudate by cotton-tipped applicators and, when indicated, the cleansing of the external ear canals by irrigation with 3 per cent saline until free of debris.[7] Any pseudomembranes or pieces of large, desquamated epithelium were removed with forceps or suction under direct vision. Irrigations were repeated on follow-up visits when indicated.

Cultures were taken on the first visit, at three-day intervals thereafter, and on the day of discharge. Small, cotton-tipped applicators were employed for taking of cultures from both external auditory canals of every new patient. The material for culture was collected by gently inserting the tip into the ear canal. The swab was placed at once into thioglycollate broth. If the person was suspected of having otomycosis, another culture was sent for mycologic investigation. All cultures were held at room temperature until taken to the laboratory at the close of the afternoon clinic. The bacteriologic techniques have been described elsewhere.[5]

Sensitivity tests were performed routinely on the initial culture and thereafter whenever indicated. Tests were performed for dihydrostreptomycin, oxytetracycline, sulfadiazine, 4-aminomethylbenzenesulfonamide, and polymyxin. The results were recorded as very sensitive, moderately sensitive, or resistant. Nitrofurazone discs were not available and, therefore, no tests were performed with this preparation.

A total of 381 patients and 493 ears with acute diffuse external otitis were observed. Five series of cases were treated by the local application of antimicrobial agents and one with control preparations. These antimicrobial formulations have received wide usage and numerous scientific reports attest to their clinical effectiveness:[6,8,9,10,11,12]

1. Oxytetracycline HCl.*
2. Polymyxin B Sulfate.†
3. 4-aminomethylbenzenesulfonamide HCl 5 per cent.††
4. Nitrofurazone.§

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* Terramycin Otic. Oxytetracycline Hydrochloride 5 mg. per cc. Chas. Pfizer & Co., Inc., New York, New York.

† Polymyxin B (Sulfate) 200,000 Units equivalent to 20 mg. polymyxin standard for topical use only. (Dissolved in an isotonic saline vehicle to form a 0.1% solution.) Burroughs Wellcome & Co., Tuckahoe, N. Y.

†† Sulfamylon Hydrochloride Viscous Solution 5%. Contains Sulfamylon (brand of 4-aminomethylbenzenesulfonamide) hydrochloride 5%; methylcellulose 1%; glycerine 8%; and, as preservative, methyl paraben 0.1%. Winthrop-Stearns, Inc., New York 18, N. Y.

§ Furacin Anhydrous Ear Solution N.N.R. Brand of 0.2% Nitrofurazone. Contains 0.2% Nitrofurazone N.N.R. in a non-aqueous vehicle, polyethylene glycol 300. Eaton Laboratories, Norwich, New York.

5. Oxytetracycline HCl and Polymyxin B Sulfate.§§

6. Controls.

   a. Normal (0.85%) saline drops.

   b. Fatty acids in a lanolin vehicle.

To avoid any bias in the selection of antimicrobial therapy, the above medications were assigned in a pre-arranged order except where the extreme severity of the disease necessitated a combined local and systemic therapy. As patients were admitted to the ear clinic, the recorder selected the next drug on the list for administration, and this choice was noted on the patient's chart; thus, the professional personnel had no control over the therapeutic agent given. Those cases receiving combined local and intramuscular antimicrobial therapy were not included in the series of cases studied comparatively.

In the clinical handling of these cases, it was neither practicable nor desirable to persist rigidly with an initial therapy to which the patient was not responding. If, after several days, the patient showed no improvement, the medication was changed. The new therapy was chosen on the basis of *in vitro* bacteriologic sensitivity reports; however, following a change of treatment there was uncertainty whether improvement was a delayed response to the original medication, to an early response to the new medication, or to combined action. Thus, in the evaluation of response to local therapy, the data included in this series are the observations on the initial therapeutic regime.

The dosage of the medications used in all cases was that suggested by the pharmaceutical companies. Drops were applied directly into the external auditory canal or by cotton wick moistened with the therapeutic agent. The technique selected was determined by the amount of edema of the skin of the ear canal. If the edema was rated three or more, the wick method was arbitrarily chosen. As soon as the edema subsided, drops were substituted and the wick eliminated. When a wick was used, five drops of drug were applied every

§§ Terramycin Otic. Oxytetracycline Hydrochloride 5 mg.; Polymyxin B Sulfate 10,000 Units; Benzocaine 5%; 90% Propylene Glycol per cc.. Chas. Pfizer & Co., Inc., New York, New York.

four hours while the patient was awake. When the drops alone were used, the patient was instructed to lie on the unaffected side, place five drops in the involved ear, and remain in that position for five minutes. He was then asked to sit erect and allow the excess medication to drain out upon cotton held at the meatus.

Patients were requested to return daily except on weekends. Only severe cases were seen on Saturday, and the Clinic was closed on Sunday. Not uncommonly, patients did not return after making favorable progress, since follow-up visits were not required by military order. For purpose of tabulation, these patients were counted as cured as of the date of the last visit to the Clinic. Despite the admitted limitations of the statistical data due to such influences, it is to be noted that military personnel returned for observation with a regularity which is rarely attained in civilian practice.

From the detailed clinical data recorded on admission and on each follow-up visit, selected observations were used as indices of clinical change. These included the subjective manifestations of pain and tenderness and the objective finding of edema. The criteria for discharging a patient consisted of absence of pain, no edema of the external canal, and 2+ or less erythema. (A rating of 2+ or less erythema on discharge was permitted since the medication often caused a slight erythema.) A negative bacteriologic culture was not considered necessary for discharge since some percentage of patients continued to have Gram-negative bacilli in their external auditory canals after all symptoms and physical findings had disappeared.

RESULTS.

A total of 381 patients and 493 ears with acute diffuse otitis externa were observed. Two-hundred-and-sixty-nine were unilateral and 112 bilateral. The statistical data on follow-up treatment and examinations were satisfactory in 403. Excluding the 17 severe cases given both systemic and local antimicrobial therapy on the initial visit, there were 386 infected ears for comparative study of the effectiveness of the various therapeutic agents and procedures used. The local

medications employed and the number of cases with follow-up data for each treatment series is shown in Table 1.

The comparability of the series of cases under observation has been examined in varying ways. The data in Table 2 are

TABLE 1.

LOCAL MEDICATION EMPLOYED AND THE NUMBER OF CASES OBSERVED WHERE THERE WERE ADEQUATE FOLLOW-UP EXAMINATIONS.

Series* No.	Local Medication	Number of Cases
1	Terramycin otic	67
2	Polymyxin in saline	95
3	Sulfamylon aqueous	77
4	Furacin otic	65
5	Terramycin-Polymyxin otic	50
6	No anti-microbial therapy	32
	TOTAL	386

* In subsequent tables, therapy employed is shown by treatment series number.

TABLE 2.

REPRESENTATIVE DATA INDICATING THE COMPARABILITY OF CASES IN THE DIFFERENT TREATMENT SERIES.

Characteristic	Percentage of all cases with the indicated characteristics by treatment series.*						
	Average	1	2	3	4	5	6
Severity — Mild	50	42	49	53	48	50	63
No previous otitis externa	50	57	50	53	47	42	48
Age — Under 25 years	64	64	61	71	71	52	63
Wax in ear, excessive	32	36	24	31	33	43	33
Pain — Moderate to severe	62	61	61	70	64	55	70
Itchiness	38	38	41	30	36	48	36
Feeling of Fullness in Ear	75	80	77	71	73	75	70
Initial culture positive for *Pseudomonas*	76	72	76	86	78	58	87

* See Table 1.

illustrative. The severity of the disease in each of the series was closely similar except for Series 6. These cases tended to be of the milder category. It is possible that the more severe cases were rejected as proper subjects for the use of saline drops or fatty acid preparations only. The degree of pain in the different treatment series was closely similar.

Series 5 differs somewhat from the others. This may be explained in part by the fact that this series was initiated in the latter part of the study as a substitute for one of the original therapeutic agents, the manufacture of which was discontinued. At that time, there were fewer students at the Center. With a reduction of young trainees, a higher proportion of the cases were regular Navy personnel of older age. Also a lower percentage of Series 5 was positive for *Pseudomonas*. This is in line with findings of 1952 when the percentage of positive cases declined beginning in September.[13] The total score rating for the severity of pain and tenderness and the rating for the degree of edema are given in Tables 3 and 4. In considering these, it is to be remembered that not all patients returned daily, and in general those progressing least favorably were the ones seen most frequently. These distorting influences become more marked by days of therapy and the observations presented here are limited, therefore, to five days from the beginning of treatment.

The data in Tables 3 and 4 show the progress of all patients to be relatively slow. When measured by the subjective symptoms of pain and tenderness, or the objective finding of edema, Series, 1, 2, 3, and 5 progressed more rapidly than those in Series 4 or 6. Treatments 1 and 5 seem to have given the greatest amount of relief from pain and tenderness and a somewhat more rapid response to therapy. Series 5 showed almost complete resolution of pain and tenderness on the fourth day. Progress was less favorable with treatments 2, 3, and 4 in this category. No appreciable difference appeared in the rate of decline of pain and tenderness in patients on treatment 4 as compared with those receiving no antimicrobial therapy on the fourth and fifth days.

As previously mentioned, it was believed that the edema of the ear canal provided a more objective measure of change in

TABLE 3.

THE AVERAGE "SEVERITY SCORE" FOR PAIN AND TENDERNESS BY DAY OF TREATMENT AND THERAPY EMPLOYED.*

Day of Treatment	Average "Severity Score" by Treatment†						Average "Severity Score" by Treatment As a Per Cent of the Initial Average Score					
	1	2	3	4	5	6 & 7	1	2	3	4	5	6 & 7
Initial	7.84	7.51	8.56	8.87	5.46	7.85	100.0	100.0	100.0	100.0	100.0	100.0
1	6.28	6.81	6.21	7.00	5.30	5.96	80.1	90.7	72.5	78.9	97.1	75.9
2	4.12	3.18	3.61	4.51	2.42	4.83	52.6	42.3	42.2	50.8	44.3	61.5
3	2.41	3.11	3.60	2.78	3.00	4.92	30.7	41.4	42.1	31.3	54.9	62.7
4	1.27	1.33	2.04	2.11	0.11	1.86	16.2	17.7	23.8	23.8	2.0	23.7
5	0.50	1.31	1.00	2.44	0	2.17	6.4	17.4	11.7	27.5	0	27.6

* See Table 1.
† Maximum Score, pain 10, tenderness 10, Total 20.

TABLE 4.

THE AVERAGE "SEVERITY SCORE" FOR EDEMA BY DAY OF TREATMENT AND THERAPY EMPLOYED.*

Day of Treatment	Average "Severity Score" by Treatment†						Average "Severity Score" by Treatment As a Per Cent of the Initial Average Score					
	1	2	3	4	5	6 & 7	1	2	3	4	5	6 & 7
Initial	3.18	3.18	2.87	2.60	2.70	2.38	100.0	100.0	100.0	100.0	100.0	100.0
1	3.02	2.82	2.42	2.61	2.95	2.23	95.0	88.7	84.3	100.4	109.3	93.7
2	2.49	2.15	1.59	1.97	2.10	2.17	78.3	67.6	55.4	75.8	77.8	91.2
3	1.63	1.58	1.66	1.83	2.18	1.83	51.3	49.7	57.8	70.4	80.7	76.9
4	0.95	1.38	0.91	1.50	1.22	1.86	29.9	43.4	31.7	57.7	45.2	78.2
5	0.25	1.19	0.93	1.56	0.75	1.50	7.9	37.4	32.4	60.0	27.8	63.0

* See Table 1.
† Maximum score 10.

TABLE 5.

NUMBER AND PER CENT OF PATIENTS WHOSE THERAPY WAS CHANGED BY DAY OF TREATMENT AND INITIAL THERAPY EMPLOYED.*

Day of Treatment	Cumulative Number of Patients Switched at End of Each Day of Treatment						Cumulative Number of Patients Switched As a Per Cent of Total Patients					
	1	2	3	4	5	6 & 7	1	2	3	4	5	6 & 7
Total Patients	67	95	77	65	50	32	100.0	100.0	100.0	100.0	100.0	100.0
1	1	10	7	1	2	8	1.5	10.5	9.1	1.5	4.0	25.0
2	3	11	14	3	5	9	4.5	11.6	18.2	4.6	10.0	28.1
3	7	14	16	6	6	13	10.4	14.7	20.8	9.2	12.0	40.6
4	10	15	17	6	7	17	14.9	15.8	22.1	9.2	14.0	53.1
5	10	19	18	7	7	17	14.9	20.0	23.4	10.8	14.0	53.1
End of Treatment	11	26	19	11	7	19	16.4	27.4	24.7	16.9	14.0	59.4

* See Table 1.

TABLE 6.

NUMBER AND PER CENT OF PATIENTS "CURED" BY DAY OF TREATMENT AND THERAPY EMPLOYED.*

Day of Treatment	Cumulative Number of Patients "Cured" at End of Each Day of Treatment						Cumulative Number of Patients "Cured" As a Per Cent of Total Patients					
	1	2	3	4	5	6 & 7	1	2	3	4	5	6 & 7
Total Patients	67	95	77	65	50	32	100.0	100.0	100.0	100.0	100.0	100.0
1	6	11	4	10	4	0	9.0	11.6	5.2	15.4	8.0	0
2	9	20	11	23	15	1	13.4	21.1	14.3	35.4	30.0	3.1
3	20	25	19	30	23	2	29.9	26.3	24.7	46.2	46.0	6.2
4	30	37	30	39	27	3	44.8	38.9	39.0	60.0	54.0	9.4
5	33	42	35	43	30	4	49.3	44.2	45.5	66.2	60.0	12.5
End of Treatment	56	69	58	54	43	13	83.6	72.6	75.3	83.1	86.0	40.6

* See Table 1.

the condition of the ear canal. It is seen that Table 4 confirms the previous observation on pain and tenderness. Series 1 and 5 show the most rapid reduction in edema and the greatest total improvement after five days. Series 4 offers very little more improvement than seen with the control group. On the other hand, Series 2, 3, and 5 show very similar response to therapy.

Further comparative data are given in Tables 5 and 6. The number and percentage of cases in which the initial therapy was considered ineffective are given in Table 5. Here the wide difference between those receiving and those not receiving antimicrobial therapy is evident. The number of ears in which therapy was changed was less in Series 1 and 5 than in Series 2 and 3. The related findings in Table 6 showing the number and percentage of ears cured by the initial therapy tend to support the opinion that treatments 1 and 5 were superior to 2 and 3.

There was, however, a sharp divergence in the findings for treatment 4. The data in Tables 3 and 4 suggest a poor response of pain and tenderness and edema while Tables 5 and 6 indicate that this form of therapy is equal in effectiveness to the other preparations in the number of ears cured and in the number requiring a change in medication.

Of some concern in the use of the preparation in Series 4 was the observation for possible local sensitivity reactions. Minor local reactions could reasonably account for the less favorable rating of this preparation when measured by pain, tenderness, and edema; however, no such reactions necessitating a change of drug were observed in this series.

Although follow-up bacteriologic examinations were limited since repeat cultures were taken ordinarily only every third day of treatment, the striking feature of the findings as shown in Table 7 is the persistence of Pseudomonas in the ear canal. These data, however, fail to indicate the quantitative change in the relative numbers of Pseudomonas present in the ear. The major change observed during treatment was the decline in the number of Pseudomonas colonies on positive plates. In 126 cases, terminal cultures were taken as the pa-

tient was being discharged as cured and even here 25 per cent were positive for Pseudomonas. A smaller number of ears showed positive terminal cultures in Series 5 than in the others (See Table 7).

TABLE 7.

THE PERCENTAGE OF CASES WITH CULTURES POSITIVE FOR *Pseudomonas aeruginosa* BY DAY OF TREATMENT AND THERAPY EMPLOYED.*

Day of Treatment	Therapy*					
	1	2	3	4	5	6
Initial	72	76	86	78	58	87
1 – 2	50	69	87	78	22	84
3 – 4	52	44	90	53	21	85
5 – 7	75	50	75	56	31	84

* See Table 1.

Analysis of the data on the 17 severe cases treated initially by systemic and local antimicrobial therapy indicated that pain and tenderness began to decrease gradually after 24 hours, but that there was no substantial reduction in erythema or edema for the first four days of treatment. The limited bacteriologic data indicated that the combined systemic and local medication was no more effective than the Series 5 preparation alone in controlling the growth of bacteria obtained on culture of the ear canal.

Results of *in vitro* sensitivity tests performed on Pseudomonas isolated on initial cultures are shown in Table 8. These observations suggest that a higher percentage of the cultures are sensitive to oxytetracycline HCl and sulfadiazine. Of all Pseudomonas examined *in vitro* for sensitivity to oxytetracycline, 4 per cent were found to be resistant. Of 66 found resistant to polymyxin, and also tested for sensitivity to oxytetracycline, only three (4 per cent) were also resistant to this compound. There was no suggestion of any correlation in the sensitivity or resistance of Pseudomonas to these two compounds.

TABLE 8.

SENSITIVITY OF *Pseudomonas* TO VARIOUS ANTIBIOTICS ON INITIAL EXAMINATION.

Antibiotic	Cultures					Per Cent Distribution				
	Total Tested	Resistant	Moderately Sensitive	Very Sensitive	Sensitive Degree Not Stated	Total Tested	Resistant	Moderately Sensitive	Very Sensitive	Sensitive Degree Not Stated
Terramycin	281	11	142	128	—	100.0	3.9	50.5	45.6	—
Streptomycin	281	241	33	7	—	100.0	85.8	11.7	2.5	—
Polymyxin	216	66	—	—	150	100.0	30.6	—	—	69.4
Sulfadiazine	281	14	24	243	—	100.0	5.0	8.5	86.5	—
Sulfamylon	281	20	115	146	—	100.0	7.1	40.9	52.0	—

DISCUSSION.

The preliminary observations in the evaluation of therapy of otitis externa in 1952 in Florida were in line with the findings of the more comprehensive study of 1953. The conclusion of the preceding year that "no therapeutic agent could be considered to be uniformly and highly satisfactory" is not challenged by the more recent findings. The response to therapy in many cases was "discouragingly slow."

It is interesting to note that remarkable results were obtained with each of the drugs in certain instances, even when fatty acids or saline preparations alone were used. Thus the general impression was confirmed that thorough cleansing and prophylactic care of mild cases often produced results without recourse to antimicrobial medication. This was not true of the more severe varieties which often necessitated more than one therapeutic agent or procedure to control the disease. In only a few instances were the reactions so severe that hospitalization was recommended. It is believed that further efforts utilizing a larger series should be made to study the response of the various grades of disease to treatment.

It should be emphasized that the unique opportunity of studying a large series of cases under almost ideal conditions at a military base provided unusual control of patients as well as an opportunity to select only cases of acute diffuse external otitis for this study. All patients with complicating generalized dermatologic problems, seborrheic dermatitis, or localized or disseminated neurodermatitis, were rejected for use in this investigation. A clear distinction between furunculosis and diffuse external otitis was made, and wherever there was any question, follow-up cultures and clinical observations were made before it was decided to include the patient in this series.

The practical importance of *in vitro* sensitivity tests is not fully established. At best these should serve only as a guide for therapy; they cannot infallibly predict the effectiveness of any given medication when applied locally. Where a choice exists as to a medication to be applied topically, it is natural

that the choice should go to the preparation which has the greatest *in vitro* activity; however, other factors such as effectiveness in the presence of exudates and secretions modify the therapeutic response, and these factors must be weighed by the otologist in the selection of the medication of choice.

A limitation in the clinical importance of bacteriologic cultures deserves comment. It is the opinion of one of us (B.H.S.) that the Pseudomonas infection is a superimposed disease and that the primary disease exists deep in the dermis and must be approached in some manner other than by local antimicrobial therapy. This theory does not minimize the necessity of efficacious local surface therapy to eradicate the pseudomonas organisms. It is believed, however, that further investigation will provide the evidence which will show that the proper approach to therapy of the more severe varieties of acute diffuse external otitis is by way of the parenteral route, thus attacking directly the deeper inflammation present in and around the apocrine glands.

SUMMARY.

1. A total of 493 ears with acute diffuse external otitis was observed, 269 unilateral and 112 bilateral. Of the 493 cases, 403 returned for follow-up treatment and examination; 17 were given combined systemic and local therapy, thus leaving 386 infected ears in the series studied comparatively.

2. These 386 were divided into 6 series and were treated with the following preparations:—

   1) Oxytetracycline HCl (containing 5 mg. per cc.).

   2) Polymyxin B Sulfate (dissolved in an isotonic saline vehicle to form a 0.1 per cent solution).

   3) 4-Aminomethylbenzenesulfonamide HCl (commercial 5 per cent aqueous solution).

   4) Nitrofurazone Anhydrous Ear Solution (containing 0.2 per cent Nitrofurazone in a non-aqueous vehicle).

5) Oxytetracycline-Polymyxin Otic (contains 5 mg. of oxytetracycline and 10,000 Units of polymyxin per cc.).

6) Controls.

a) Normal (0.85 per cent) saline drops.

b) Fatty acids in a lanolin vehicle.

3. None of the therapeutic agents studied could be considered to be uniformly and highly satisfactory. In some cases response to therapy was discouragingly slow.

4. When measured by subjective symptoms of pain and tenderness and the objective finding of edema, oxytetracycline, or a combination of oxytetracycline and polymyxin, seemed to offer slightly better results than other preparations.

5. When the number of patients cured after five days as well as the number of patients requiring an alteration of therapy are compared, there is little difference in the effectiveness of the various antimicrobial agents.

6. Bacteriologic observations confirm the high incidence of Pseudomonas in acute diffuse external otitis. The major change observed during treatment was the decline from many to few Pseudomonas found in cultures. In 25 per cent of the patients reported clinically cured, Pseudomonas could still be cultured from the external ear canal.

7. In vitro sensitivity tests performed on Pseudomonas isolated on initial cultures revealed that the least number of strains were resistant to sulfadiazine and oxytetracycline. Thus, only 4 per cent of the strains found resistant to polymyxin and also tested for sensitivity to oxytetracycline, only 3 per cent were resistant to this compound.

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BRONCHOESOPHAGOLOGY COURSE.

The next Bronchoesophagology Course to be given by the Temple University School of Medicine is scheduled for January 31st - February 11th, 1955, under the direction of Dr. Chevalier L. Jackson.

Interested registrants will please write directly to the Department of Laryngology and Bronchoesophagology, Temple University School of Medicine, 3400 North Broad Street, Philadelphia 40, Pa.

BACTERIOLOGICAL STUDIES OF OTITIS EXTERNA

1951, 1952, AND 1953.*

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Singer, *et al.*, in 1951, examined bacteriologically and mycologically 1,377 normal and 646 infected external auditory canals.[1] They concluded, as have other authors, that the mycological flora had limited, if any, etiological significance. The *Pseudomonas* group of organisms appeared to have an important etiological role though other Gram negative bacilli and streptococci also occurred more commonly in the infected than in the normal ears. The study upon which these tentative conclusions were based was primarily a laboratory investigation. The individuals examined were contacted only when cultures were taken, and there was no correlation of clinical data with the laboratory findings. During the two following years, these bacteriological investigations have been continued in association with clinical studies of the relative efficacy of anti-microbial therapy. This report comprises a summary of all findings in this laboratory on the bacteriological flora of the normal ear and those with otitis externa.

The individuals studied during these investigations were young adult males serving either at the U. S. Naval Air Sta-

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tion in Jacksonville, Florida, or at McDill Field in Tampa, Florida. During 1953 the study was limited to Jacksonville. Clinical data on these are presented separately by Senturia, *et al.*[2] In each year the investigations were conducted during the summer months beginning in June and terminating in October. During 1952 and 1953 at the Naval Air Station and in 1952 also at McDill Field a special "Ear Clinic" was established. All service personnel applying for treatment of an ear disorder, possibly or presumably due to otitis externa, were referred to the Clinic for diagnosis and treatment. A limited number of civilian dependents were seen also. On all cases seen in 1952 and 1953, detailed clinical observations were collected and were available for study.

The culture procedures employed were essentially the same throughout the entire study. The media were prepared from dehydrated products (Difco) according to the manufacturer's recommendation. Those used included fluid thioglycollate medium (in 16 x 125 mm. tubes), eosin-methylene blue agar, and blood agar (Bacto proteus No. 3 agar plus 5 per cent whole citrated human blood). Cultures were taken by one of the participating bacteriologists or by the physician at the clinic. Sterile, small, cotton-tipped swabs were used, and material for culture was obtained by gently inserting the tip into the canal of the infected or normal ear. In 1952, all cultures were taken in duplicate. One was used for a direct streaking of an eosin-methylene blue plate, all other swabs were placed immediately into a tube of thioglycollate broth. This, and the inoculated eosin-methylene blue plates were taken to the laboratory at the conclusion of the afternoon clinic and were incubated overnight at 37° C. The broth, if sufficiently turbid to indicate growth, was examined after this period of incubation. Those remaining clear were incubated for 48 hours before being discarded as negative. Transplants from the broth were plated to both blood agar and EMB agar. Standard techniques were employed for the isolation and the identification of organisms.

The bacteriological findings in cases of otitis externa and in comparable cultures taken from the normal ear are shown in Table 1. The normals examined in 1953 were service personnel observed in a trial of prophylaxis of otitis externa with

TABLE 1.

BACTERIOLOGICAL FINDINGS IN CULTURES OF NORMAL AND INFECTED EXTERNAL AUDITORY CANALS 1951, 1952 AND 1953.

Organism	Number and Per Cent of Cultures for Specified Organism									
	Acute Otitis Externa						Normal Ears			
	1951		1952		1953		1951		1953	
	No.	Per Cent	No.	Per Cent	No.	Per Cent	No.	Per Cent	No.	Per Cent
Pseudomonas Group	423	65.5	375	80.8	371	75.5	14	1.0	29	1.3
Proteus Group	53	7.9	45	9.7	41	8.3	5	.4	5	.2
Coli-Aerogenes Group	213	32.9	152	32.7	111	22.6	72	5.2	90	4.0
Alcaligenes Group	43	6.7	20	4.3	18	3.6	22	1.6	24	1.1
Paracolon Group	6	.9	11	2.4	6	1.2	5	0.4	2	.1
Alpha-type Streptococci	22	3.4	25	5.4	10	2.0	24	1.7	4	.2
Beta-type Streptococci	25	3.9	10	2.2	20	4.0	0	0	2	.1
Gamma-type Streptococci	49	7.6	65	14.0	42	8.5	15	1.1	515	23.4
Beta-hemolytic Staphylococcus Albus	174	26.8	131	28.2	171	36.6	801	58.8	1,420	64.5
Non-hemolytic Staphylococcus Albus	81	12.5	129	27.8	49	9.8	467	32.5	1,065	48.4
Beta-hemolytic Staphylococcus Aureus	64	9.9	70	15.0	42	8.5	128	9.3	24	1.1
Non-hemolytic Staphylococcus Aureus	40	6.1	45	9.7	2	.4	90	6.5	33	1.5
Beta-hemolytic Staphylococcus Citreus	3	.4	2	.4	2	.4	19	1.4	14	.6
Non-hemolytic Staphylococcus Citreus	1	.1	0	0	0	0	15	1.1	26	1.2
Chromogenic Soil Organisms	4	.6	2	.4	5	1.0	34	2.5	0	0
Spore-formers only	0	0	26	5.6	1	.2	182	13.2	18	.8
Diphtheroids	Omitted	–	10	2.2	17	3.4	Omitted	–	374	17.0
Total Examinations	646		464		491		1,377		2,200	

results reported by Senturia.[3] With few exceptions, there is a high degree of consistency in the observations on cases of acute otitis externa in each of the three years and on the normal ears during the two years this examination was performed. The variations in the percentage of normal ears with Gamma type streptococci and of Beta-hemolytic and Nonhemolytic staphylococcus aureus in 1951 and 1953 cannot be securely explained but presumably indicate a true difference in the distribution of this flora.

The proportion of cases of acute otitis externa found positive for organisms of the *Pseudomonas* group varied in part with the criteria employed in diagnosing this infection. In 1952 the cases referred to the "Ear Clinic" were divided into four groups as reported by Yawn, *et al.*[4] Acute cases with pain, diffuse edema, redness of the canal and a definite purulent exudate were accepted as acute otitis externa and 80.8 per cent of these were positive for *Pseudomonas*. A small number had had symptoms for over 30 days prior to treatment. These were classified as chronic otitis externa and 37.5 per cent of these were positive for *Pseudomonas*. There were also some very mild disorders with itching, or slight pain, little if any redness and no purulent exudate. Lacking an expert opinion, these were not finally diagnosed. Only 24.3 per cent of these were positive for *Pseudomonas*. At McDill Field in 1952 the cases referred to the "Ear Clinic" were typical and relatively severe and of these 90.5 per cent yielded *Pseudomonas*. In Jacksonville during 1952, 84.0 per cent of those considered to be severe cases were positive as compared with 71 per cent in those of moderate severity. The comparable percentages for 1953 were 85.5 and 75.1 respectively.

The consistent rarity of *Pseudomonas* in the normal external ear canal as compared with its occurrence in large numbers in a high percentage of the exudative cases of otitis externa was striking. The conclusion that it is implicated as the sole or an associated cause in a very high proportion of these cases of otitis externa appears warranted.

The other Gram negative bacilli also were found more commonly in the infected as compared with the normal ear. Members of the *Proteus* group were found with particular fre-

quence in cases which proved resistant to treatment. The bacteriological evidence suggested that these and the Alpha and Beta Type Streptococci may have a less important and less frequent role in the etiology of otitis externa. There was no evidence to implicate other bacteria. While extensive mycological examinations were conducted by us only in 1951, still the clinical observations in 1952 and 1953 did not provide evidence to question the conclusion that mycological flora play a very limited role in the etiology of acute otitis externa.

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INDIANA UNIVERSITY MEDICAL CENTER

The Department of Otolaryngology, Indiana University School of Medicine, offers its annual Anatomical and Clinical Course in Otolaryngology, February 7 - 19, 1955. Applicants should address The Post-Graduate Office, Indiana University Medical Center, Indianapolis 7, Indiana.

TWO HUNDRED BRONCHOSCOPIES IN PULMONARY TUBERCULOSIS.*

A Comparison with Corresponding Findings in the Pre-streptomycin Era.

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Many years passed after the discovery of bronchoscopy, before this method was employed systematically in the diagnosis and therapy of tracheo-bronchial tuberculosis. For a considerable time bronchoscopy was judged to be a dangerous procedure in pulmonary tuberculosis.

Von Eicken,[1] the pupil and successor of Killian as the chief of the Department of Otolaryngology at the University of Berlin, published a survey of the history of bronchoscopy in 1939, and even then did not mention the application of this procedure in pulmonary tuberculosis.

Myerson,[2] in 1928, was the first clinician to employ bronchoscopy in this disease. The 1930s were the pioneer years in the use of bronchoscopy on tuberculous patients, by Myerson, Kernan,[3] and Clerf.[4] Due largely to their efforts, bronchoscopy is today used as a very important, one might almost say indispensable, aid in the diagnosis of bronchial tuberculosis. Except for severe tuberculosis of the larynx and a poor general condition, there are few contraindications to bronchoscopy in pulmonary tuberculosis.

The severity and incidence of pulmonary tuberculosis and its complications has been considerably reduced by the treatment with streptomycin and other antibiotics. To prove that the same happened in bronchial tuberculosis one has only to

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* From the service of the late Dr. Lloyd, Department of Bronchoscopy, Municipal Sanatorium, Otisville, N. Y., Department of Hospitals.

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study the pertinent literature of the years prior to 1946. Following is the essence of literature from 1936 to 1944, published in a review by Holinger.[5]

The incidence in patients, in whom a bronchial involvement was suspected, was 30 to 60 per cent, while perforations of tuberculous lymph nodes into the trachea or bronchi occurred in only 1.3 per cent.

Four pathological groups of bronchial tuberculosis must be differentiated: *1.* Submucosal involvement; *2.* Ulcerations with granulations; *3.* Hyperplasia; *4.* Stage of healing or fibrosis.

The route of infection is either direct surface implantation, direct extension from the parenchymal lesion, or from the hilar nodes. Rarely occurs a lymphogenous or hematogenous spread. Incidence of bronchial obstruction was high.

The literature in this field is quite extensive, and I quote but a few authors.

Froste[6] performed 1000 bronchoscopies on 420 patients with pulmonary tuberculosis between 1944 and 1947. His findings were specific tuberculous bronchitis, atelectasis, bronchostenosis, lymphadenitis with perforation into the bronchus, and bronchogenic cancer. There was a combined frequency of 37.2 per cent of positive findings, while the incidence of perforated lymph nodes into the bronchus was only 1.2 per cent.

Acuna's[7] statistics showed 29.7 per cent positive cases of bronchial tuberculosis. Besides the usual lesions he saw displacement of trachea and bronchi, deformities of the lumen, and partial, or total stenosis of the bronchi.

Besides other indications for bronchoscopy, mentioned by Acuna, we consider positive gastric cultures which are not consistent with the clinical and roentgenological findings and also certain conspicuous markings of the bronchi on the X-ray picture as another indication for bronchoscopy.

An unusually high percentage of bronchial tuberculosis was found by Stone[8] in 1945, at the Norfolk County Sanatorium,

Mass. Of all patients bronchoscoped because of suspicious symptoms, 50 per cent showed evidence of endobronchial tuberculosis.

Myerson[9] in 580 patients, bronchoscoped before 1941, found 160 patients with evidence of endobronchial disease, 28 per cent. All lesions with the exception of granulomata secondary to perforating mediastinal glands, were due to an ulcerous lesion in the lung parenchyma. Myerson points out that tuberculosis of trachea and bronchi follows a definite course, in which the various predictable stages can be distinguished.

In most instances the granuloma, extending from the branch bronchus, fills the main bronchus with a resultant atelectasis of the entire lung. As soon as the granuloma occludes the bronchus, the sputum becomes negative.

Tuberculosis of the finer bronchi and bronchioles cannot be proved, but it occurs in a very high percentage. Myerson thought that the treatment of choice at this time, namely cauterization with 30 per cent silver nitrate solution and the dilatation of a stenosed bronchus, rarely helped the patient, and sometimes probably harmed him. Lloyd[10] expressed the same opinion in a study based on 475 bronchoscopies, the most of which were also performed at Sanatorium Otisville. He saw no cases in which cauterization had been of any value and observed no permanent increase of the lumen of a bronchus following dilatation.

Hemoptysis, reappearance of tubercle bacilli, and ulcers have followed the instrumental stretching of a healthy scar. The frequency of positive findings, however, was so high, that abnormal findings were present in practically all cases. A number of mechanical changes were observed by this author like torsions and distortions, clockwise and counterclockwise rotation of bronchi and carina, and inward bulging of bronchi, probably due to pressure of mediastinal lymph glands. He warns against collapse therapy in certain cases of bronchial tuberculosis, since it could become a serious impediment to pulmonary drainage and thus might lead to secondary atelectasis.

Pathological findings in autopsies showed even a higher percentage of bronchial tuberculosis than bronchoscopy.

Auerbach[11] in 1949 published a study of bronchial lesions obtained in 1000 autopsies of tuberculous patients. There was evidence of tracheo-bronchial tuberculosis in 421 cases, *i.e.* 42.1 per cent. In only 12 cases, *i.e.* 1.2 per cent was the lesion due to a rupture of tuberculous regional lymph glands into the tracheo-bronchial tree.

In another post mortem study, based on 125 autopsies and performed before 1943, Salkin,[12] *et al.*, observed about the same percentage of bronchial tuberculosis as Auerbach, namely 40 to 50 per cent. Auerbach's and Salkin's post mortem findings prove that in most cases of cavitation the draining bronchus is involved.

Today, under treatment with streptomycin, PAS, isoniacid, collapse therapy, and surgery, most of these lesions will heal without producing symptoms.

When the pulmonary lesion improves it often heals spontaneously even before streptomycin and other methods of treatment are applied.

A conspicuous difference exists in the occurrence of perforations of hilar lymph glands into trachea and bronchi as reported in the United States of America and Europe. According to the reports of Froste[6] and Auerbach[11] the incidence of this complication in the United States is about 1.2 per cent, Holinger quotes 1.3 per cent; Schwarz,[13] in Europe, on the other hand, reports about 106 scars due to such perforations among 426 autopsies, or about 25 per cent. Hanns[14] confirms the latter's report and is convinced that the bronchial tuberculosis secondary to perforation of caseous hilus glands has widely increased in the decade between 1938 and 1948. Dufourt[15] and Monnier made the same observation.

This conspicuous difference in the incidence of perforation of caseous hilus glands into the tracheo-bronchial tree between the reports from Europe and the United States may be related to the malnutrition of large sections of the population in many European countries during the war and postwar years. Such nutritional deficiencies probably hastened the necrotic process in the mediastinal glands, so that there was no time for the erection of a protecting wall around the glands by fibrotic

thickening of the capsule. This type of bronchial tuberculosis occurs not uncommonly without specific involvement of the lungs; however, stenosis and atelactasis are frequent complications.

Brunner[16] and Soulas[17] warn against collapse therapy in bronchial stenosis because of the danger of complete and irreversible atelectasis. Tuttle,[18] *et al.*, consider bronchial stenosis a very serious complication. Of their 92 patients with bronchial stenosis, 23 patients (32 per cent) died of poststenotic suppuration and extension of the bronchial disease, and they conclude that patients with healed stenosis face great uncertainty. The incidence in empyema and unexpanded lungs in cases of bronchial stenosis is as high as 39.9 to 46.7 per cent. His fatality rate of 27 patients with poststenotic suppurations was 55 per cent.

The postbronchoscopic state is not always uneventful. Radner[19] observed a number of incidents among 183 bronchoscopies. In 18 cases a postbronchoscopic rise of temperature occurred within 72 hours. This was a nonspecific reaction without any significance. In 26 cases a secondary rise of temperature between the tenth and sixteenth day occurred following bronchoscopy. Many of these patients complained of headache, anorexia, and increased cough. The febrile period usually lasted from two to three weeks, but extended sometimes into months, accompanied by manifest changes in the X-ray pictures. Radner quotes several other authors who saw a spread of the disease following bronchoscopy. He is of the opinion that this secondary rise of temperature may be due to the formation of a new, or the reactivation of an old focus.

Salkin,[12] *et al.*, noted a fair number of reactions, such as nausea, vomiting, dizziness, and even syncope, due to the local anesthetic of 2 per cent pontocaine solution.

At Otisville all bronchoscopies are performed under local anesthesia with 10 per cent cocaine solution for the larynx and a 3 per cent solution for the bronchi. The premedication consists of nembutal 1.5 gr. on the evening prior to bronchoscopy. This is repeated in the morning and 1/6 gr. morphine

with 1/150 gr. atropine in 5 cc. normal saline solution is administered intravenously immediately before the local anesthesia is started. Except for some dizziness after the morphine injection which passes within a few minutes, we rarely had unpleasant reactions. It is our impression that the cocaine solution is less toxic than the pontocaine solution due to our premedication. There is evidence that the barbiturates reduce the toxic effect of cocaine. Bastedo[20] recommends barbiturates for the prophylaxis and treatment of cocaine poisoning.

Our own material consists of 200 bronchoscopies, which were performed on 188 patients at the Municipal Sanatorium, Otisville, N. Y., in 1951 and 1952. All these bronchoscopies were performed by our visiting physicians, the late Dr. Lloyd, Dr. Chochet, of New York City, and Dr. Feldman, of Middletown, N. Y. The anesthesia was done by the author.

Our findings follow:

1. Partial or complete obstruction of the main bronchus or one of its branches, buckling and bulging of bronchi, 11 cases, 6 per cent;

2. Clockwise or counterclockwise rotation of carina of a main bronchus or its branches, 11 cases, 6 per cent;

3. Edema of the mucous membrane of the bronchus, 10 cases, 5.3 per cent;

4. Granulations in the lumen of the bronchi, 10 cases, 5.3 per cent.

5. Inflammatory acute infiltrative reaction, three cases, 1.6 per cent;

6. Bulging of trachea or main bronchus due to enlarged mediastinal glands, three cases, 1.6 per cent;

7. Granulomata, two cases, 1.1 per cent;

8. Ulcerations, two cases, 1.1 per cent;

9. Atelectasis due to obstruction, two cases, 1.1 per cent.

Several of these conditions were often present in the same patient. Evidence of endobronchial tuberculosis was found in

29 patients, or 15 per cent. This incidence is significantly lower than the figures of 30 to 50 per cent, which were given by a number of other authors before the introduction of the treatment of pulmonary tuberculosis with antibiotics.

All of our cases of endobronchial tuberculosis occurred in patients with moderate or far advanced pulmonary tuberculosis. Not one case of perforation of enlarged caseous hilus glands into the bronchus was seen, although in three patients we found a bulging of the trachea or main bronchus, obviously due to pressure by enlarged mediastinal glands. We seldom observed a primary rise of temperature following bronchoscopy. In seven patients the temperature rose slightly on the first or second day after bronchoscopy and returned to normal within 24 hours. In one case a slightly increased temperature of 99 degrees persisted for ten days. We never saw a secondary rise of temperature with spread of the disease, which Radner[19] observed in 14.3 per cent of his cases.

The aspect of endobronchial tuberculosis today is completely different from that of the prestreptomycin period. Myerson[9] had already expressed the opinion, and Lloyd[10] concurred in it, that the treatment of endobronchial tuberculosis with 30 per cent silver nitrate solution, the standard procedure of that time — did more harm than good to the patient. Modern treatment employs streptomycin, PAS, isoniacid, collapse therapy, and surgery. Local treatment of the bronchi has become obsolete.

Although we frequently saw a narrowing of the bronchi due to edema, swelling of the mucous membrane, and granulations, we failed to see the fibrotic and scarred bronchi which, according to Tuttle[18] accounted for empyema, unexpanded lungs, and suppurations in 39 per cent with a high fatality. With the exception of six patients who are still in the Hospital improving, all other patients were discharged as inactive, with the working ability of four hours a day. The fibrotic scars which we do see, never cause a severe stenosis of the bronchus. We agree with Myerson and Lloyd that the treatment with silver nitrate solution contributed widely to the formation of fibrotic scars and stenosis of the bronchi. Only

in one case did we see endobronchial tuberculosis associated with laryngeal tuberculosis.

Some of the deformities, revealed by bronchoscopy in our case material, such as rotated carina, angulated bronchi, buckling and collapsed openings of bronchi, were probably caused by pneumoperitoneum. In one case inspissated mucous caused the obstruction of a main bronchus. A contracted right upper lobe was the cause of an acute angulation of the right upper lobe bronchus.

The conclusion can be reached that endobronchial tuberculosis today is one of the complications of pulmonary tuberculosis, the incidence and severity of which has been considerably reduced by modern methods of treatment.

SUMMARY.

For many years bronchoscopy has been considered a dangerous procedure in pulmonary tuberculosis; however, 20 years ago this procedure was introduced as the most important aid in the diagnosis of endobronchial tuberculosis.

The frequency of endobronchial tuberculosis was comparatively high before the introduction of streptomycin. A review of the literature has shown a reported frequency of 30 to 50 per cent positive findings in bronchoscopies and 40 to 50 per cent in autopsies. Granulations and ulcers, treated with 30 per cent silver nitrate solution, healed frequently with fibrotic scars, and stenosis of the main bronchus or one of its branches resulted. This was followed by atelectasis, insufficient expansion of the lung after pneumothorax, empyema, and suppurations of lung parenchyma with a high fatality rate.

The whole aspect of endobronchial tuberculosis improved with the introduction of streptomycin and PAS, and within the last two years of isoniacid. These drugs comprise the therapy of choice in pulmonary and endobronchial tuberculosis. The endobronchial tuberculosis usually heals without scar formation, and, therefore the incidence of bronchial stenosis and its sequelae is greatly reduced. In our material of 200 bronchoscopies the incidence of endobronchial tuberculosis has been 15 per cent as compared to an incidence of 30 per cent or more reported in the prestreptomycin era.

A number of deformities was revealed by bronchoscopy in our case material, as rotated carinae, angulated bronchi, buckling of bronchi, and collapsed openings of bronchi. Some of them were probably caused by pneumoperitoneum.

Complications due to local anesthetic were rare and never dangerous. We feel that the anesthesia with 10 per cent cocaine solution for the larynx and 3 per cent solution for the bronchi may produce fewer reactions than 2 per cent pontocaine solution, since it is possible to reduce the toxicity of cocaine effectively by preoperative administration of barbiturates. Secondary rise of temperature with spread or reactivation of the lesion following bronchoscopy was not seen in any of our cases. Although such complications have been reported by other authors, modern treatment methods probably prevented the occurrence of such unfortunate after-effects in our patients.

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Triboro Hospital, Jamaica, N. Y.

In Memoriam

HARRIS PEYTON MOSHER, M.D.,

1867-1954.

In the death of Dr. Harris P. Mosher in Salem, Massachusetts Hospital, Thursday, November 4, 1954, American otolaryngology lost another of its outstanding pioneers.

Dr. Mosher had lived over forty years in Boston and Marblehead, Mass.

Born in Woodford's, Maine, in 1867, he graduated from Boston Latin School, from Harvard College in 1892 and from Harvard Medical School in 1896, in the first class requiring four years for a degree. He became Harvard's first professor of otology and laryngology, the first full time teaching role in these specialties in this country, and continued in service there for over four decades.

It is given to few men to attain the leadership in their chosen field such as Dr. Harris P. Mosher achieved in his. By universal acclaim he was known as "The Chief." Some used this form of address as a friendly salutation, others in awe or respect; but everyone included in its use a feeling of reverence. His death brings to an end an era in otolaryngology the like of which will not be seen again.

No memorial can detail all of Dr. Mosher's achievements so no attempt will be made to do so here. Outstanding among them, however, is the fact that not only was he a member of all of the national otolaryngologic societies but he, in turn, served as president of each of them. When the American Board of Otolaryngology was formed he was chosen as its

president and served in that capacity for 25 years. While others worked hard for its position of excellence in the field of medicine, it was his driving zeal and high ideals which were responsible for the major share of its accomplishments. He was the recipient of many honors, among them several honorary degrees from leading American Universities and the Semon Medal from the Royal Society of Medicine of London, England. In 1931 Dr. Mosher was awarded the Gold Medal of the American Laryngological Association, and in 1939 a similar medal was awarded to him by the American Academy of Ophthalmology and Otolaryngology.

He will be remembered best, however, as a teacher of his specialty, at Harvard University, his Alma Mater, the Massachusetts General Hospital and the Massachusetts Eye and Ear Infirmary. He added fame to these illustrious institutions as citadels of learning. Testimony to his exceptional skill as a teacher is the number of his "boys" who have become chairmen of their departments in many schools and hospitals. He inspired more men to such attainments than any other teacher of his time, and scores of men who did not seek such positions owe their otolaryngologic successes to him.

He was an "inventor" as well as a doctor. He designed several instruments which added much to the surgical armamentarium of his day. In addition, he outlined several surgical procedures which remain as standards to the present. Among the most notable, being his technique in the ethmoid labyrinth and his method for the removal of safety pins swallowed by babies, for which he was given a Citation by the American College of Surgeons, in 1934. He was not a surgeon, with emphasis on fine detail as would suit the present era of fenestration surgery, but rather he was bold and brave, eminently fitted to attack the ravages of infection.

In 1905 Dr. Mosher became a collaborator on the staff of

THE LARYNGOSCOPE and his guiding counsel throughout these many years has been instrumental in attaining the enviable position this journal now holds in otolaryngologic literature.

Harris P. Mosher was an artist. This helped him immensely in his teaching endeavors, finding expression in telling illustrations. Many pictures of merit came from his pen or brush. He was an artist with a camera, and color photography furnished for him one of his great pleasures.

No memorial to Dr. Mosher would be complete without reference to his ability to find an appropriate word for a particular occasion. He was a past-master at repartee. The use of this gift enlivened many a national meeting when he rose to discuss a paper. His thinking was incisive, so he was quick to discuss a presentation if he thought it was lacking in merit; yet he was equally willing to give praise if it was deserved. At the last national meeting he attended, he went out of his way to praise a young man who had made his first national presentation. He lent rich color to all our gatherings.

There were many who thought Dr. Mosher was a rough, gruff man. This was because they did not know him, for he used an apparent austerity to cover one of the kindest and softest hearts we shall ever know. Many recipients of his graciousness and kindness testify to this. The number of young men to whom Dr. Mosher gave a friendly helping hand is legion.

Above all, he was loyal. Certainly he was loyal to the institutions he served. He was more than loyal to his "boys." His devotion to his wife, Helen, was magnificent. Finally, he was loyal beyond words to his chosen work; he gave his life for it, and its present enviable status is in no small measure due to his efforts.

A veteran of the Spanish-American War and World War I, he served overseas with the Harvard Hospital Unit in the former and in the Surgeon General's office in Washington, in the latter, holding the rank of Colonel.

Besides his many activities in the field of otolaryngology, Dr. Mosher found time to enjoy his memberships in several clubs, among them St. Botolph's, University, Boston Yacht and the Harvard Clubs of Boston and New York.

McCrae, at the close of World War I, wrote these words for those who gave their lives on one of its famous battlefields:

"To you from falling hands we throw the torch.
Be yours to hold it high."

Today, these words could well be coming to us from Harris P. Mosher. In the light of all that he was and all that he represented, it is our bounden duty to hold high indeed all that he passed on to us!

G. D. H.

UNIVERSITY OF FLORIDA MID-WINTER SEMINAR.

The Ninth Annual University of Florida Mid-winter Seminar in Ophthalmology and Otolaryngology will be held at the Sans Souci Hotel in Miami Beach, the week of January 17, 1955. The lectures on Ophthalmology will be presented on January 17, 18, and 19, and those on Otolaryngology on January 20, 21, and 22. A mid-week feature will be the Mid-winter Convention of the Florida Society of Ophthalmology and Otolaryngology on Wednesday afternoon, January 19, to which all registrants are invited. The registrants and their wives may also attend the informal banquet at 8 p.m., on Wednesday. The Seminar schedule permits ample time for recreation.

The Seminar lecturers on Ophthalmology this year are: Dr. William F. Hughes, Jr., Chicago; Dr. Phillips Thygeson, San Jose; Dr. James Allen, New Orleans; Dr. Walter H. Fink, Minneapolis; and Dr. Milton L. Berliner, New York. Those lecturing on Otolaryngology are: Dr. Paul Holinger, Chicago; Dr. Lawrence R. Boies, Minneapolis; Dr. Edmund P. Fowler, Jr., New York; Dr. Arthur W. Proetz, St. Louis, and Dr. David DeWeese, Portland, Oregon.

ANNOUNCEMENT.

An introductory course in Reconstructive Surgery of the Septum and External Nasal Pyramid will be given, under the direction of Dr. Maurice Cottle, March 19 through 26, 1955, at the University of Oregon Medical School. This will be sponsored by the Department of Otolaryngology.

INTERNATIONAL ASSOCIATION OF LOGOPEDICS AND PHONIATRICS.

The Tenth International Congress for Speech and Voice Therapy will take place in Barcelona, Spain, September 3 - 7, 1956.

Those practicing in the field of speech and voice therapy and in allied professions are invited to attend this Congress.

The following official reports will be presented: Stuttering — Dr. Wendell Johnson (Iowa); Neurology and Speech and Language Disorders — Dr. Antonio Subirana, (Barcelona); Non-verbal Tests of Intelligence and Maturity — Dr. Edeltrud Baar (Vienna); Amusia — Dr. Augusta Jellinek (New York).

Those submitting papers should notify the Organizing Secretary not later than January, 1956. No paper can be accepted unless a summary of not more than 100 words has been received by the Organizing Secretary before May 15, 1956. Time limit for paper — ten minutes. Articles that have been previously published cannot be accepted for the Congress.

The official languages of the Congress are English, French, German, and Spanish.

For further details, apply to the Organizing Secretary: Dr. J. Perelló, Provenza 319, Barcelona (9), Spain.

THE AMERICAN LARYNGOLOGICAL, RHINOLOGICAL AND OTOLOGICAL SOCIETY, INC., MEETINGS.

MID-WINTER.

Eastern Section Meeting.....Friday, January 7, 1955
Philadelphia, Pa., Hotel Warwick

Triological Council Meeting.....Saturday, January 8, 1955
New York City, The Waldorf-Astoria

Western Section Meeting...Saturday-Sunday, Jan. 15-16, 1955
Los Angeles, Cal., The Town House

Southern Section Meeting.....Saturday, January 22, 1955
Charlottesville, Va., Medical School Auditorium

Middle Section Meeting.....Monday, January 24, 1955
Detroit, Mich., Sheraton-Cadillac Hotel

SPRING.

American Board of Otolaryngology
Richmond, Va., March 6-10, 1955

All Society Meetings will be held at the Hollywood Beach Hotel, Hollywood, Florida.

American Laryngological Association.....March 13, 14, 1955
Triological Society.....(mornings only) March 15, 16, 17, 1955
American Broncho-Esophagological Association
(afternoons only) March 15, 16, 1955
American Otological Society, Inc.....March 17, 18, 1955

The Hollywood Beach Hotel (American plan) is a delightful place to hold the Spring Meetings — you may wish to bring the family along. The Hotel offers its guests such features as ocean bathing, deep sea fishing, 18-hole golf course and country club, tennis and many other activities.

For hotel reservations please communicate with Mr. John W. Tyler, Manager, Hollywood Beach Hotel, Hollywood, Florida.

TWENTY-FOURTH ANNUAL MID-WINTER CLINICAL CONVENTION IN OPHTHALMOLOGY AND OTOLARYNGOLOGY, JANUARY 17 THROUGH JANUARY 28, 1955.

The Research Study Club of Los Angeles announces its Twenty-fourth Annual Mid-Winter Clinical Convention in Ophthalmology and Otolaryngology, January 17 through January 28, 1955. For the Ear-Nose-Throat, the main Guest Lecturers will include Dr. Theodore E. Walsh, Professor and Head of the Department of Otolaryngology, Washington University, St. Louis; and Dr. John J. Conley, Chief of the Head and Neck Service, St. Vincent's Hospital, New York City, and Clinical Professor of Otorhinolaryngology, New York University, and other appointments.

Dr. Walsh has long been known to us not only as a professor, but also as a lecturer in our national societies, with particular interest in otologic and rhinologic problems.

Dr. Conley has done a great deal of work in tumors and plastic surgery of the head and neck, as well as being a well trained man in the broader field of our specialty.

Also serving on our program with Didactic Lectures will be Dr. Kenneth C. Brandenburg of Long Beach, Dr. J. C. Almy Harding of San Diego, and Dr. Paul J. Moses of San Francisco.

Instruction Courses in Otolaryngology will be provided by Dr. E. R. V. Anderson, Dr. Norman Jesberg, Dr. Harold Owens, and Dr. Manuel R. Wexler, all of Los Angeles, and Dr. Leo Shahinian of San Francisco.

The main Guest Lecturers for the Eye program will be Dr. Edmund B. Spaeth and Dr. Irving H. Leopold, both from the University of Pennsylvania Graduate School of Ophthalmology.

The first week will be devoted to the Ear-Nose-Throat—from Monday to Saturday, January 17 through January 22. The Eye week will cover Monday to Friday, January 24 through January 28. Those of us who confine our work to only one of these specialties may complete either subject in one week.

On Tuesday evening, January 18, the Annual Banquet of the Los Angeles Society of Ophthalmology and Otolaryngology will honor the Guest Lecturers of that week. This will be held at 7:00 p.m. in the Ball Room of the Elks Club.

On Wednesday afternoon of each week motion pictures will be shown, Ear-Nose-Throat subjects the first week, and Eye subjects the second week. These afternoons will also afford time for relaxation, sight-seeing, golf, radio broadcasts, and the enjoyment of points of interest in and about Los Angeles, including the famous Huntington Library with its collection of rare books and art.

The American Laryngological, Rhinological and Otological Society, Western Section, will hold its Annual Meeting at The Town House immediately preceding this Convention, Saturday and Sunday, January 15 and 16. On Saturday afternoon the scientific session is open to members and all interested otolaryngologists. Saturday evening there will be a dinner meeting for members of the Triologic Society only. Sunday morning, the second scientific session is open to all interested. The president of the Society, Dr. Kenneth M. Day, after attending this Society's Annual Meeting, will be with us during a portion of the Mid-Winter Course of the Research Study Club.

Unless you have your own plans for a place to stay, it is advised that you write for reservations at an early date to Mr. H. M. Nickerson, Manager of the Elks Club, 607 South Parkview Street, Los Angeles 57. He will endeavor to arrange suitable quarters for you in a conveniently located hotel, and will confirm the reservation by return mail.

Each applicant must be a member, in good standing, of the American Medical Association *in Order to Become Eligible* for attendance at the Convention. The fee for the entire two weeks, or any part of it, is $100.00 and includes the cost of all luncheons. We are informed that these dues are an income-tax deductible item, as they represent an annual membership fee. Make your Check payable to "Mid-Winter Clinical Convention," and mail to Pierre Violé, M.D., Treasurer, 1930 Wilshire Boulevard, Los Angeles 57. If anything prevents your attendance, this fee will be returned to you.

DIRECTORY OF OTOLARYNGOLOGIC SOCIETIES.

(Secretaries of the various societies are requested to keep this information up to date).

AMERICAN OTOLOGICAL SOCIETY.

President: Dr. D. E. Staunton Wishart, 170 St. George St., Toronto 5, Ontario, Canada.
Vice-President: Dr. Wm. J. McNally, 1509 Sherbrooke St., West Montreal 25, Canada.
Secretary-Treasurer: Dr. John R. Lindsay, 950 E. 59th St., Chicago 37, Illinois.
Editor-Librarian: Dr. Henry L. Williams, Mayo Clinic, Rochester, Minn.
Meeting: Hollywood Hotel, Hollywood, Fla., March 17 (afternoon), 18 (forenoon and afternoon), 19 (forenoon), 1955.

AMERICAN LARYNGOLOGICAL ASSOCIATION.

President: Dr. Henry B. Orton, Newark, N. J.
First Vice-President: Dr. Jas. H. Maxwell, Ann Arbor, Mich.
Second-Vice-President: Dr. Clyde A. Heatley, Rochester, N. Y.
Secretary: Harry P. Schenck, Philadelphia, Pa.
Treasurer: Fred W. Dixon, Cleveland, Ohio.
Librarian-Historian: Dr. Bernard J. McMahon, St. Louis, Mo.
Meeting: Hollywood Hotel, Hollywood, Fla., March 13-14, 1955.

AMERICAN LARYNGOLOGICAL, RHINOLOGICAL AND OTOLOGICAL SOCIETY, INC.

President: Dr. Kenneth M. Day, 121 University Pl., Pittsburgh, Pa.
President-Elect. Dr. Dean M. Lierle, Iowa City, Iowa.
Secretary: Dr. C. Stewart Nash, 277 Alexander St., Rochester, N. Y.
Eastern Section Meeting, Friday, January 7, 1955, Philadelphia, Pa., Hotel Warwick.
Triological Council Meeting, Saturday, January 8, 1955, New York City, The Waldorf-Astoria.
Western Section Meeting, Saturday - Sunday, January 15 - 16, 1955, Los Angeles, Cal., The Town House.
Southern Section Meeting, Saturday, January 22, 1955, Charlottesville, Va., Medical School Auditorium.
Middle Section Meeting, Monday, January 24, 1955, Detroit, Mich., Sheraton-Cadillac Hotel.
Meeting: Hollywood Hotel, Hollywood, Fla., March 15-16-17, 1955, morning only.

AMERICAN MEDICAL ASSOCIATION, SECTION ON LARYNGOLOGY, OTOLOGY AND RHINOLOGY.

Chairman: Dr. F. W. Davison, Danville, Pa.
Vice-Chairman: Dr. Guy L. Boyden, Portland, Ore.
Secretary: Dr. Hugh A. Kuhn, Hammond, Ind.

AMERICAN ACADEMY OF OPHTHALMOLOGY AND OTOLARYNGOLOGY.

President: Dr. Algernon B. Reese, 73 East 71st St., New York 21, N. Y.
Executive Secretary: Dr. William L. Benedict, Mayo Clinic, Rochester, Minn.
Meeting: Palmer House, Chicago, Ill., October 9-15, 1955.

AMERICAN BOARD OF OTOLARYNGOLOGY.

Meeting: Hotel Marshall, Richmond, Va., March 6-10, 1955.
Palmer House, Chicago, Ill., October, 1955.

AMERICAN BRONCHO-ESOPHAGOLOGICAL ASSOCIATION.

President: Dr. Clyde A. Heatley, 11 No. Goodman St., Rochester, N. Y.
Secretary: Dr. F. Johnson Putney, 1719 Rittenhouse Square, Philadelphia, Pa.
Meeting: Hollywood Beach Hotel, Hollywood, Fla., March 15-16, 1955, afternoon only.

PUGET SOUND ACADEMY OF OPHTHALMOLOGY AND OTOLARYNGOLOGY.

President: Dr. Clifton E. Benson, Bremerton, Wash.
President-Elect: Dr. Carl D. F. Jensen, Seattle, Wash.
Secretary: Dr. Willard F. Goff, 1215 Fourth Ave., Seattle, Wash.

THE SECTION OF OTOLARYNGOLOGY OF THE MEDICAL SOCIETY OF THE DISTRICT OF COLUMBIA.

Chairman: Dr. John Louzan.
Vice-Chairman: Dr. Willard B. Walters.
Secretary: Dr. Jack L. Levine.
Treasurer: Dr. Russell S. Page, Jr.
Meetings are held on the third Tuesday of October, November, March and May, 7:00 P.M.
Place: Army and Navy Club, Washington, D. C.

GEORGIA SOCIETY OF OPHTHALMOLOGY AND OTOLARYNGOLOGY.

Meeting: General Oglethorpe Hotel, Savannah, Ga., March 11-12, 1955.

THE GREATER MIAMI EYE, EAR, NOSE AND THROAT SOCIETY.

President: Dr. George McKenzie, Dupont Medical Bldg., Miami, Fla.
Vice-President: Dr. Maurice Edelman, 605 Lincoln Road, Miami Beach, Florida.
Secretary: Dr. James H. Mendel, Jr., 7241 Red Road, Miami, Fla.
Meeting: Quarterly, at Seven Seas Restaurant, February, May, October, and December.

CHICAGO LARYNGOLOGICAL AND OTOLOGICAL SOCIETY.

President: Dr. Norman Leshin, 55 East Washington St., Chicago, Ill.
Vice-President: Dr. Henry B. Perlman, 950 East 59th St., Chicago, Ill.
Secretary-Treasurer: Dr. Stanton A. Friedberg, 122 So. Michigan Ave., Chicago, Ill.
Meeting: First Monday of each Month, October through May.

THE LOUISIANA-MISSISSIPPI OPHTHALMOLOGICAL AND OTOLARYNGOLOGICAL SOCIETY.

President: Dr. W. L. Hughes, Lamar Life Bldg., Jackson, Miss.
Vice-President: Dr. Ralph H. Riggs, 1513 Line Ave., Shreveport, La.
Secretary: Dr. Edley H. Jones, 1301 Washington St., Vicksburg, Miss.

OTOSCLEROSIS STUDY GROUP.

President: Dr. Gordon D. Hoople, 1100 East Genesee St., Syracuse, N. Y.
Secretary: Dr. Lawrence R. Boies, Med. Arts Bldg., Minneapolis 2, Minn.
Meeting: Palmer House, Chicago, Ill., Oct. 9, 1955.

AMERICAN SOCIETY OF OPHTHALMOLOGIC AND OTOLARYNGOLOGIC ALLERGY.

President: Dr. F. Lambert McGannon, 14595 Madison Ave., Lakewood 9, Ohio.
Secretary-Treasurer: Dr. Michael H. Barone, 468 Delaware Ave., Buffalo 2, N. Y.
Meeting: Palmer House, Chicago, Ill., October, 1955.

PAN AMERICAN ASSOCIATION OF OTO-RHINO-LARYNGOLOGY AND BRONCHO-ESOPHAGOLOGY.

President: Dr. J. M. Tato, Azcuenaga 235, Buenos Aires, Argentina.
Executive Secretary: Dr. Chevalier L. Jackson, 1901 Walnut St., Philadelphia 3, Pa., U. S. A.
Meeting: Fifth Pan American Congress of Oto-Rhino-Laryngology and Broncho-Esophagology.
President: Dr. J. H. Font, Medical Arts Bldg., San Juan, P. R.
Time and Place: 1956, Puerto Rico.

MISSISSIPPI VALLEY MEDICAL SOCIETY.

President: Dr. Arthur S. Bristow, Princeton, Mo.
Secretary-Treasurer: Dr. Harold Swanberg, Quincy, Ill.
Assistant Secretary-Treasurer: Dr. Jacob E. Reisch, Springfield, Ill.
Meeting:

THE VIRGINIA SOCIETY OF OPHTHALMOLOGY AND OTOLARYNGOLOGY.

President: Dr. G. S. Fitz-Hugh, Charlottesville, Va.
President-Elect: Dr. H. L. Mitchell, Lexington, Va.
Vice-President: Dr. Marion K. Humphries, Charlottesville, Va.
Secretary-Treasurer: Dr. L. B. Sheppard, 301 Medical Arts Bldg., Richmond, Va.
Spring Meeting: Natural Bridge Hotel, Natural Bridge, Va., May 7-8, 1955.

LOS ANGELES SOCIETY OF OPHTHALMOLOGY AND OTOLARYNGOLOGY.

President: Harold Owens, M.D.
Secretary-Treasurer: Robert A. Norene, M.D.
Chairman of Section on Ophthalmology: Sol Rome, M.D.
Secretary of Section on Ophthalmology: Wendell C. Irvine, M.D.
Chairman of Section on Otolaryngology: Max E. Pohlman, M.D.
Secretary of Section on Otolaryngology: Herschel H. Burston, M.D.
Place: Los Angeles County Medical Association Building, 1925 Wilshire Boulevard, Los Angeles 57, Calif.
Time: 6:00 P.M., first Thursday of each month from September to June inclusive—Ophthalmology Section. 6:00 P.M., fourth Monday of each month from September to June inclusive—Otolaryngology Section.

AMERICAN OTORHINOLOGIC SOCIETY FOR THE ADVANCEMENT OF PLASTIC AND RECONSTRUCTIVE SURGERY.

President: Dr. Harry Nievert, 555 Park Ave., New York (21), N. Y.
Secretary: Dr. Louis Joel Fleit, 66 Park Ave., New York (16), N. Y.
Meeting:

NORTH CAROLINA EYE, EAR, NOSE AND THROAT SOCIETY.

President: Dr. Cecil Swann, Asheville, N. C.
Secretary and Treasurer: Dr. Geo. B. Ferguson, Durham, N. Car.
Meeting:

SOUTH CAROLINA SOCIETY OF OPHTHALMOLOGY AND OTOLARYNGOLOGY

President: Dr. David S. Asbill, Columbia, S. Car.
Vice-President: Dr. John McLean, Greenville, S. Car.
Secretary-Treasurer: Dr. Roderick Macdonald, Rock Hill, S. Car.
Meeting:

PACIFIC COAST OTO-OPHTHALMOLOGICAL SOCIETY.

President: Dr. Leland G. Hunnicutt, 98 N. Madison Ave., Pasadena, Calif.
Secretary-Treasurer: Dr. John F. Tolan, 3419 47th Ave., Seattle (5), Wash.
Meeting:

THE RESEARCH STUDY CLUB OF LOS ANGELES, INC.

Chairman: Dr. Isaac H. Jones, 635 S. Westlake, Los Angeles, Calif.
Treasurer: Dr. Pierre Violé, 1930 Wilshire Blvd., Los Angeles, Calif.
Program Chairmen:
Otolaryngology: Dr. Leland G. Hunnicutt, 98 N. Madison Ave., Pasadena, Calif.
Ophthalmology: Dr. Harold F. Whalman, 727 W. 7th St., Los Angeles, Calif.
Mid-Winter Clinical Convention annually the last two weeks in January at Los Angeles, Calif.

FLORIDA SOCIETY OF OPHTHALMOLOGY AND OTOLARYNGOLOGY.

President: Dr. Chas. C. Grace, 145 King St., St. Augustine, Fla.
President-Elect: Dr. Jos. W. Taylor, 706 Franklin St., Tampa, Fla.
Secretary-Treasurer: Dr. Carl S. McLemore, 1217 Kuhl Ave., Orlando, Fla.

THE PHILADELPHIA LARYNGOLOGICAL SOCIETY.

President: Dr. William J. Hitschler.
Vice-President: Dr. Chevalier L. Jackson.
Treasurer: Dr. John J. O'Keefe.
Secretary: Dr. Joseph P. Atkins.
Historian: Dr. Herman B. Cohen.
Executive Committee: Dr. Thomas F. Furlong, Jr., Dr. William A. Lell, Dr. Harry P. Schenck, Dr. Benjamin H. Shuster, ex-officio.

SOUTHERN MEDICAL ASSOCIATION, SECTION ON OPHTHALMOLOGY AND OTOLARYNGOLOGY.

Chairman: Dr. Edley H. Jones, 1301 Washington St., Vicksburg, Miss.
Vice-Chairman: Dr. K. W. Cosgrove, 111 E. Capitol Ave., Little Rock, Ark.
Secretary: Dr. F. A. Holden, Medical Arts Bldg., Baltimore, Md.
Meeting:

WEST VIRGINIA ACADEMY OF OPHTHALMOLOGY AND OTOLARYNGOLOGY.

President: Dr. James K. Stewart, Wheeling, W. Va.
Secretary-Treasurer: Dr. Frederick C. Reel, Charleston, W. Va.

CENTRAL ILLINOIS SOCIETY OF OPHTHALMOLOGY AND OTOLARYNGOLOGY.

President: Dr. G. C. Otrich, Belleville, Ill.
President-Elect: Dr. Phil R. McGrath, Peoria, Ill.
Secretary-Treasurer: Dr. Alfred G. Schultz, Jacksonville, Ill.

DALLAS ACADEMY OF OPHTHALMOLOGY AND OTOLARYNGOLOGY.

President: Dr. Oscar Marchman, Jr., Dallas, Texas.
Secretary-Treasurer: Dr. Morris F. Waldman, Dallas, Texas.

BALTIMORE NOSE AND THROAT SOCIETY

Chairman: Dr. Albert Steiner, 1308 Eutaw Pl., Baltimore, Md.
Secretary-Treasurer: Dr. Walter E. Loch, 1039 No. Calvert St., Baltimore, Maryland.

SOCIEDAD DE OTO-RINO-LARINGOLOGIA, COLEGIO MEDICO DE EL SALVADOR, SAN SALVADOR, C. A.

President: Dr. Salvador Mixco Pinto.
Secretary: Dr. Daniel Alfredo Alfaro.
Treasurer: Dr. Antonio Pineda M.

CANADIAN OTOLARYNGOLOGICAL SOCIETY
SOCIETE CANADIENNE D'OTOLARYNGOLOGIE

President: Dr. G. Edward Tremble, 1390 Sherbrooke St., West, Montreal, P. Q.
Secretary: Dr. G. Arnold Henry, 170 St. George St., Toronto, Ontario.
Meeting: Bigwin Inn, Lake of Bays, Muskoka, Ontario. June 16 to June 18, 1955.

MEXICAN ASSOCIATION OF PLASTIC SURGEONS.

President: Dr. Cesar LaBoide, Mexico, D. F.
Vice-President: Dr. M. Gonzalez Ulloa, Mexico, D. F.
Secretary: Dr. Juan de Dios Peza, Mexico, D. F.

FEDERACION ARGENTINA, DE SOCIEDADES DE OTORRINOLARINGOLOGIA.

Secretario del Exterior: Dr. Juan Manuel Tato.
Sub-Secretario del Exterior: Dr. Oreste E. Bergaglio.
Secretario del Interior: Dr. Eduardo Casterán.
Sub-Secretario del Interior: Dr.Atilio Viale del Carril.
Secretario Tesorero: Dr. Vicente Carri.
Sub-Secretario Tesorero: Dr. José D. Suberviola.

ASOCIACION DE OTO-RINO-LARINGOLOGIA DE BARCELONA, SPAIN.

Presidente: Dr. J. Abello.
Vice-Presdente: Dr. Luis Suñe Medan.
Secretario: Dr. Jorge Perelló, 319 Provenza, Barcelona.
Vice-Secretario: Dr. A. Pinart.
Vocal: Dr. J. M. Ferrando.

SOCIEDAD NACIONAL DE CIRUGIA OF CUBA.

Presidente: Dr. Reinaldo de Villiers.
Vicepresidente: Dr. César Cabrera Calderin.
Secretario: Dr. José Xirau.
Tesorero: Dr. Alfredo M. Petit.
Vocal: Dr. José Gross.
Vocal: Dr. Pedro Hernández Gonzalo.

INTERNATIONAL BRONCHOESOPHAGOLOGICAL SOCIETY.

President: Dr. Andre Soulas, Paris, France.
Secretary: Dr. Chevalier L. Jackson, 1901 Walnut St., Philadelphia 3, Pa. U. S. A.
Meeting:
Time and Place:

ASSOCIACAO MEDICA DO INSTITUTO PENIDO BURNIER — CAMPINAS.

President: Dr. Heitor Nascimento.
First Secretary: Dr. Roberto Barbosa.
Second Secretary: Dr. Roberto Franco do Amaral.
Librarian-Treasurer: Dr. Leoncio de Souza Queiroz.
Editors for the Archives of the Society: Dr. Guedes de Melo Filho, Dr. Penido Burnier and Dr. Gabriel Porto.

SOCIEDAD CUBANA DE OTO-LARINGOLOGIA.

President: Dr. Reinaldo de Villiers.
Vice-President: Dr. Jorge de Cárdenas.
Secretary: Dr. Pablo Hernandez.

SOCIEDAD DE OTORRINOLARINGOLOGIA Y BRONCOESOFAGOSCOPIA DE CORDOBA.

Presidente: Dr. Aldo Remorino.
Vice-Presidente: Dr. Luis E. Olsen.
Secretario: Dr. Eugenio Romero Díaz.
Tesorero: Dr. Juan Manuel Pradales.
Vocales: Dr. Osvaldo Suárez, Dr. Nondier Asís R., Dr. Jorge Bergallo Yofre.

BUENOS AIRES CLUB OTORINOLARINGOLOGICO.

Presidente: Dr. K. Segre.
Vice-Presidente: Dr. A. P. Belou.
Secretario: Dr. S. A. Aranz.
Pro-Secretario: Dr. J. M. Tato.
Tesorero: Dr. F. Games.
Pro-Tesorero: Dr. J. A. Bello.

SOCIEDAD COLOMBIANA DE OFTALMOLOGIA Y OTORRINOLARINGOLOGIA (BOGOTA, COLOMBIA).

Presidente: Dr. Alfonso Tribin P.
Secretario: Dr. Felix E. Lozano.
Tesorero: Dr. Mario Arenas A.

SOCIEDAD ESPANOLA DE OTORRINOLARINGOLOGIA.

Presidente: Dr. D. Adolfo Hinojar Pons.
Vice-Presidente: Dr. D. Jose Perez Mateos.
Secretario General: Dr. D. Francisco Marañés.
Tesorero: Dr. D. Ernesto Alonso Ferrer.

ASOCIACION DE OTORRINOLARINGOLOGIA Y BRONCOESOFAGOLOGIA DE GUATEMALA

Presidente: Dr. Julio Quevedo, 15 Calle Oriente No. 5.
First Vice-Presidente: Dr. Héctor Cruz, 3a Avenida Sur No. 72.
Second Vice-Presidente: Dr. José Luis Escamilla, 5a Calle Poniente No. 48.
Secretario-Tesorero: Dr. Horace Polanco, 13 Calle Poniente No. 9-D.

FIRST CENTRAL AMERICAN CONGRESS OF OTORHINOLARYNGOLOGY.

President: Dr. Victor M. Noubleau, San Salvador.
Secretary-Treasurer: Dr. Hector R. Silva, Calle Arce No. 84, San Salvador, El Salvador, Central America.

SOCIEDAD DE ESTUDIOS CLINICOS DE LA HABANA

Presidente: Dr. Frank Canosa Lorenzo.
Vice-Presidente: Dr. Julio Sanguily.
Secretario: Dr. Juan Portuondo de Castro.
Tesorero: Dr. Luis Ortega Verdes.

FOURTH LATIN-AMERICAN CONGRESS OF OTORINOLARINGOLOGIA.

President: Dr. Dario.
Secretary:
Meeting: Lima, Peru, 1957.

SIXTH INTERNATIONAL CONGRESS OF OTOLARYNGOLOGY

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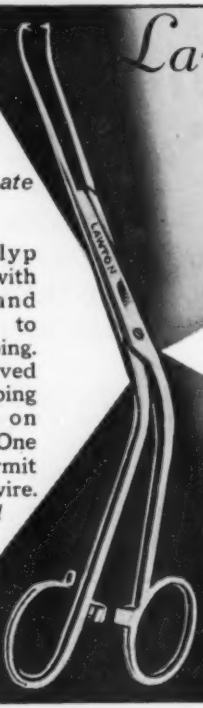

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